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CHRONIC RESPIRATORY INFECTIONS IN CHILDHOOD.[1]

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THE child with a cough is one of the commonest problems in pædiatrics. Consideration of this condition covers a wide field, as both upper and lower respiratory tracts may be affected. In this paper tuberculous and non-tuberculous infections will be compared and their clinical manifestations outlined, as they occur from infancy to adolescence.

[1] Read at a meeting of the Victorian Branch of the British Medical Association on March 4, 1931.

Chronic Tuberculous Infections.

At the outset the process of tuberculous infection and the production of tuberculous disease must be clearly differentiated. The former is common, the latter much less common. Studies of the pathology of tuberculous infection, first made by Ghon and Albrecht,[(1)] have thrown much light on this subject. It has been demonstrated that tuberculous respiratory infection is a process usually commencing in childhood and characterized by successive stages of development.

The primary lung involvement is practically always due to inhaled human tubercle bacilli. The initial lesion is commonly single and situated close to the pleura. It consists of a defined caseous bronchopneumonic patch, which may be in any lobe of either lung, though the right side is involved

rather more often than the left. Lymphatic spread from this area leads to a larger caseous focus in the corresponding tracheo-bronchial lymphatic gland. These foci in course of time tend to become encapsuled with a small amount of fibrous tissue and the caseous contents are gradually transformed into calcareous material, occasionally recognizable in X rays films.[2] Careful *post mortem* investigations have revealed a high incidence of this healed primary lesion,[1] [7] especially in European countries. When the infection with tubercle bacilli occurs very early in infancy and is repeated, the bronchopneumonic area may be more extensive. In such a case there will be signs and symptoms of tuberculous disease and an increased likelihood of death following several months' illness. In the great majority of children this does not take place and the primary stage of infection is unaccompanied by clinical evidence of disease.

If complete healing of the initial pathological process does not take place, the infection can be said to pass over into the secondary phase. Here the pathological changes manifest themselves, not in the lung substance, but in the hilar lymph glands. Exudative swelling of the tracheo-bronchial glands increases and by lymphatic drainage may involve the remainder of the hilar system. This infection is "closed" and bacilli will not be found in the sputum. With favourable progress these glandular lesions gradually undergo fibrosis or, at times, calcification. Healing is slow and may take up most of the period of childhood. Even so, live tubercle bacilli sometimes remain after long intervals and light up again in later life. If the hilar infection progresses unfavourably, metastases from the caseating glands may enter the venous system[3] and give rise to localized or generalized lesions in other parts of the body. Less commonly caseous masses erode a bronchus and are aspirated into the lung, causing progressive bronchopneumonia of the lower lobes, which is almost invariably fatal in a matter of weeks or months. When the course is not down hill, the secondary stage of the infective process results in a gradual increase in the body's resistance to the tubercle bacillus. Should this immunization develop imperfectly, the individual at or subsequent to puberty will be liable to contract the third stage of tuberculosis—pulmonary phthisis as seen in the adult—if at this period he is subjected to reinfection or a lowering of resistance from any cause. It is characteristic of this stage that the lungs only are affected, the apices especially, and not the lymph glands. The condition is more apt to become chronic and the lesions have a greater tendency to undergo fibrosis. This phase of the disease is almost never seen before puberty and seldom before fifteen years of age.[10]

In addition to the pathological changes thus briefly summarized, tuberculous infection causes a tissue sensitization that can be demonstrated by skin reactions to tuberculin. von Pirquet's scratch test is most often used, though some authorities claim that Mantoux's intradermal method is more reliable.[4] Interesting observations on the extent and age incidence have been made by these means. As age increases, greater numbers of children in any community give positive reactions, the rate of increase depending on the degree of contact with open infections in adults.[5] Of those born and continuing to live in tuberculous homes, at least 30% will be infected in the first year, 40% by the second, 60% by the fifth and 80% by the eighth year. The mortality rate among these children, if infection takes place in the first year, may be high, especially in families with poor hygienic surroundings, deaths taking place from meningitis, bronchopneumonia or miliary tuberculosis. Early removal from their tuberculous environment, combined with proper after-care, causes a marked diminution of mortality and morbidity. It is on infants of this type that the experiment of early vaccination with Calmette's attenuated bovine virus is at present proceeding. If infection does not occur till after the third year, very few will die in childhood of tuberculosis.[6]

Taking an average community, 20% to 40% of the total number will give a positive skin reaction by puberty, the reaction being three to four times as common in home contacts as in children from non-tuberculous homes. Earlier Continental figures were considerably higher and to this extent misleading.[4] The majority of these children giving positive von Pirquet reactions will be in the secondary phase of infection. This is in fact the typical stage of tuberculosis in childhood. Most commonly this process will be confined to the hilar lymph glands and will gradually heal without noticeable evidence of ill health. In a proportion of cases, however, the tuberculous infection can properly be called a tuberculous disease[7] in that definite ill health results. Though this disease is seldom fatal in childhood, its recognition is important, as such children are prone to develop adult phthisis; and, secondly, because, under proper treatment, this development can generally be checked. On what grounds can the diagnosis of tuberculous disease of the hilar glands be made? The presence of a von Pirquet or Mantoux reaction is proof of infection. In view of the smaller percentage of positive reactions found by recent investigators,[4] the diagnostic value of this test is considerable. If a history of contact is obtainable, the likelihood of the presence of tuberculous disease is increased, especially in younger children. Failure to react to tuberculin can be taken as excluding the condition, except that after infectious illnesses or with overwhelming tuberculous infection the skin sensitivity is greatly diminished. The child will be persistently under weight; of all symptoms this is the most constant. Irritability and increased liability to fatigue will be present. Occasional bouts of fever, with the temperature over 37·8° C. (100° F.) occur. Glands in the neck are often enlarged. Some cough is usual, but a persistent cough or repeated "colds" are infrequent. Sweating, if present, is not pathognomonic, as it occurs with many chronic illnesses in children. Sputum is not a feature, and tubercle

bacilli will not be found. Hæmoptyses do not take place. Examination of the chest usually reveals no abnormality, owing to the fact that lung substance is not involved. D'Espine's sign and paravertebral dulness are not reliable. It will be noted that most of the evidence so far mentioned is either not specific or negative. Consequently other chronic infective and dietetic disorders will have to be excluded. A rise of temperature following the subcutaneous injection of old tuberculin has been considered diagnostic, but the method may not be absolutely specific, and unless carefully used can cause dangerous focal reactions. In an endeavour to arrive at greater accuracy much attention has recently been given to X ray investigation. Many difficulties arise. The enlarged glands, being centrally placed, are often more or less obscured by the great vessels, heart, vertebræ and other mediastinal structures. In order to cast a shadow, glands must contain calcium deposits.[9] Lung root markings in the inner third of the lung field, at one time considered tuberculous, are vascular in origin and not pathological. Normally these are separated from the right heart shadow by a clear space formed by the air-containing bronchus. Filling in of this area is suspicious of tracheo-bronchial involvement. Armand-Delille,[8] McPhedran[9] and others consider the presence of rounded shadows protruding from the mediastinum between the clavicular and cardiac shadows, especially if mottled with calcium deposition, to be evidence of tuberculous infection of the paratracheal hilar glands. This is likely to occur only with massive involvement. Small calcified nodes at the root of the lung are characteristic. These tend to become denser as healing proceeds. The taking of films at one metre distance with short exposures is advocated. It is necessary to correlate X ray appearances with the history and clinical findings and to observe the patient over a considerable period. A further X ray examination after some months is advisable. Many patients will show no definite radiological evidences of the hilar involvement.

It will be seen from this description that diagnosis is by no means easy. Nevertheless, if in children chronically ill and under weight, with a positive von Pirquet reaction, most of these criteria are present and persist and no other cause is probable, the diagnosis of hilar tuberculous disease is justified, especially if a history of contact is obtained. Many, if not the majority, are probably overlooked at present. Continental and American workers have shown that if such children are treated in what the Americans call a "preventorium," where proper diet, rest, exercise and general hygiene are provided, cure usually results. When sufficient time is allowed—six to twelve months—for the child to reach expected normal weight, it is found that the general health and ability to stand exertion will remain good after discharge, if the subsequent hygiene is attended to.[11] In this respect the provision of open air schools is an important factor.

The public health significance of this problem is indicated by a recent investigation of 50,000 school children in Massachusetts, made by Chadwick.[10] He concluded that 20% of these children were infected with the tubercle bacillus, that 3% had definitely diagnosed hilar tuberculosis, and that 10% needed special care owing to the presence of signs and symptoms suspicious of hilar tuberculous disease. No comparable series of figures for this city are available, but it is likely, seeing that the death rate from tuberculosis is similar in the two countries, that the American observations quoted would closely approximate to our own findings. Bronfin,[11] in reviewing 300 preventorium cases, states: "If these were detected in time and given vigilant supervision, the incidence of adult clinical tuberculosis would be greatly diminished." It is this aspect of tuberculous respiratory disease in childhood that makes the subject one of more than ordinary importance, both as regards diagnosis and prognosis.

Chronic Non-Tuberculous Infections.

Respiratory tuberculosis having been outlined as most commonly occurring in childhood, a comparison should be made with chronic infective disorders that are non-tuberculous in origin.

Pulmonary Fibrosis.

The first condition to consider is pulmonary fibrosis. This is not a large group, but cases are diagnostically and therapeutically difficult in that they tend to exacerbation and progression. Though sometimes thought to be tuberculous, very rarely is any such infection present, and the clinical and pathological findings do not resemble those of secondary tuberculosis. To understand the pathogenesis of pulmonary fibrosis a few introductory remarks are necessary on the types of acute pneumonia affecting children.

Lobar pneumonia is rare in young children. The mortality (apart from empyema) is only 4%, and the lung tends to heal completely without fibrosis.

Lobular or bronchopneumonia is more frequent. The mortality is higher. Resolution is usually complete, though at times the process may be delayed for several weeks. Pathologically the inflammation chiefly affects the bronchioles and alveoli.

A third type, first described by MacCallum, of the Johns Hopkins Medical School, is interstitial bronchopneumonia.[12] This is almost always secondary to whooping cough, influenza or measles. The onset is insidious, lasting a week or more. The initial mortality is high—over 50% in institutions, according to Howland. Pathologically, from the beginning the chief incidence is on the interstitial lung substance. It is this type of infection, mixed bacteriologically with streptococci predominating, that in the patients who survive, tends to continue as a low grade fibrosing process, usually at one or other base of the lungs, with pneumonic exacerbations from time to time, which subside after a few days.[13] In the earlier stages these patients show little impairment of health. There will be a chronic cough, often with no sputum, an absence of fever,

except in exacerbations, and generally no evidence of tuberculous infection. Examination of the chest, apart from the finding of occasional râles, will most likely reveal no abnormality. At a later stage an area of relative dulness with diminished vesicular murmur is often found. Attention should be concentrated on the early recognition of this condition. X ray examination is useful in ruling out other inflammatory disorders, such as unresolved pneumonia or chronic empyema, but does not give much evidence, except during a pneumonic recrudescence. In doubtful cases a second X ray examination is often valuable. Any chronic upper respiratory infection, particularly of the maxillary antra, will predispose to exacerbation and thus to progression. Such foci should not be allowed to remain. With the addition of early hygienic treatment, suitable diet, exercises and climate, many of these infections gradually clear up. Town life, with the practical certainty of upper respiratory reinfections at school, is inadvisable. The remote prognosis depends on the amount, duration and recurrence of the interstitial inflammation.[14] If exacerbations continue, the combination of fibrous traction and chronic inflammation gradually dilates groups of smaller bronchioles and bronchiectasis results. At this stage air entry will be greatly diminished and bronchial in nature. There will be some limitation of movement and drawing over of the mediastinum. Clubbing of the fingers, along with slight cyanosis and hyperpnœa on exertion may be observed. Sputum will be copious in many cases. The child's growth and general nutrition are almost always impaired. Accurate diagnosis of the presence and extent of the bronchiectatic dilatation can be made only by X ray examination after "Lipiodol" instillation,[15] the cavities being previously drained by posturing. Regular posturing should also be carried out as part of the treatment. A similar symptom-complex can be due to inhaled foreign bodies. As these are often non-opaque to X rays, a combination of bronchoscopic and radiological examination is required for diagnosis.

Infections of the Upper Respiratory Tract.

The last group of chronic infections to be considered is that of the upper respiratory tract. In the majority of children with chronic coughs, increased liability to "colds" and slight impairment of general health, some evidence of upper respiratory disease will be found. This is not surprising when one considers that the naso-pharynx is the first line of defence against the many varieties of droplet infection to which children are subjected. Like tuberculosis, diseases of this nature are products of civilization. Little is known as yet of the errors of hygiene that predispose to them. Investigation into dietetic factors suggests that children fed excessively on carbohydrates have a higher incidence of upper respiratory disorders,[16] probably from the lack of suitable protein and vitamins that such a diet entails.[17] Stagnant warm air in badly ventilated rooms, lack of sunlight, overclothing and overcrowding further tend to keep the mucosal and skin surfaces in an unhealthy condition, and also facilitate the spread of infection. The problem of chronic carriers cannot be dealt with in the present uncertain state of bacteriological knowledge. From whatever cause, chronic infection of the lymphoid and mucosal structures in the naso-pharynx may result in adenoid, tonsillar or sinus disease.

In any child subject to respiratory infections, including those of the middle ear, hypertrophied adenoids should be looked for and, when present, completely removed. This applies no matter how young the child may be. The tonsils are not in quite the same category. Where there is evidence of chronic tonsillar infection, recurrent tonsillitis or enlarged tonsillar glands, or when focal sepsis, such as rheumatic fever, is suspected, the tonsils should be enucleated whether they appear enlarged or not. Examination of the tonsils is not always easy, and the lower pole may be difficult to see. Simple hypertrophy, unless causing obstruction to breathing, may not be an indication for removal in all cases. Some interesting statements on this subject occur in a recent paper by Bradley[18] in the *Archives of Disease in Childhood*, on "The Tonsils and Naso-Pharyngeal Epidemics," based on the observation of three hundred school boys for over a year. He writes:

> Operation for simple enlargement continues to be a common practice in spite of considerable clinical evidence of its uselessness.
>
> There is an optimum amount of lymphoid tissue necessary for protection of the body from naso-pharyngeal diseases and their complications. Removal of part of this tissue is followed by physiological replacement in the same or other regions of the neck. Until this compensation has occurred there is increased liability to catarrhs in susceptibles.

A further conclusion in his paper is:

> That most extensive group of diseases, the droplet infections, has little to do with the tonsil or its removal. Except in the relatively rare instances where auto-infection from a chronic focus produces recurrent inflammation, acute tonsillitis is a symptom and not a disease. Tonsillectomy is symptomatic treatment and its extensive application has produced no obvious control of acute naso-pharyngeal infections. It is a red herring which must be removed from the deep waters covering the secrets of prophylaxis and treatment of the common cold and its many malicious relatives.

Similar views are expressed by Paton, of the McKenzie Institute of Clinical Research at Saint Andrews. It is probable that further observation of controlled groups for long periods will be required to decide this debatable problem.

Disease of the nasal accessory sinuses is another possibility in respiratory infections, either alone or associated with lung involvement. The maxillary antrum is present, though small, in very young children, and enlarges at the time of second dentition. Whilst disease of this is not uncommon in children, the sphenoid, ethmoid and frontal group are seldom so affected. The clinical picture of simple antral disease is fairly consistent. The child has a long standing and persistent cough, which varies

from a constant hawking to the production of phlegm. Apart from rhonchi at the roots of the lungs, chest examination usually reveals no abnormality. The temperature is normal. The child is also subject to frequent "colds" in the head, especially in winter, which tend to persist. There is often nasal obstruction and nose blowing. The exacerbations are sometimes associated with acute lower respiratory involvement necessitating several days in bed. This is particularly likely in children with chronic pulmonary fibrosis. There is little or no impairment of general health, though the appetite may be capricious. Removal of adenoids and tonsils does not cause improvement. Examination of the nose and post-nasal space may show congestion and muco-pus, though not invariably. Careful X ray investigation affords most useful additional evidence. This may show either a generalized mucosal thickening with a shadow due to muco-pus in the antral cavity or in more chronic cases polypoidal degeneration of the mucosa. As thickening and pus are present in most acute "colds" in the head, it is well to take films between these exacerbations. If doubt arises, the child's condition should be observed over a period and the X ray examination repeated some months later, when subsidence of the antral changes will at times be demonstrated. In a case with such a clinical history and reliable X ray evidence of persisting antral disease, nasal operation is advisable. Antral washout may relieve some of the symptoms, but the effect is often transitory. Double endo-nasal drainage gives better results. The most striking effect is the rapid disappearance of the cough. The liability to "colds" is diminished. It is important, particularly in more chronic and severe cases, to attend to the general hygiene of the child by providing proper food, exposure to sun, breathing exercises, suitable ventilation and climate. Operation at the commencement of summer is followed by the longest period of good weather and a lessened likelihood of reinfection during recovery. Town residence during the succeeding winter is inadvisable. A minority do not improve with such treatment. This may be due to the complication of allergic naso-pharyngitis, or to the fact that the pathological changes in the antra have progressed to a definite polyposis of the type more commonly seen in sinus disease in adults. This diagnosis can be made by means of radiological examination. In such a case the radical antral operation is required. As this is seldom needed before eleven or twelve years of age, the danger of interference with dentition and facial growth can be disregarded. In a child seen for the first time in this condition it would appear justifiable to advocate the radical operation without a preliminary endo-nasal drainage, as the sooner appropriate treatment is adopted in chronic antral disorder, the greater will be the probability of subsequent cure.

Conclusions.

In reviewing chronic respiratory disease in children several conclusions may be drawn:

First, that tuberculosis affecting this part of the body is clinically and pathologically different in childhood from the adult form and from disorders that are non-tuberculous in origin. Though not uncommon in children, in the average community it is at present difficult to diagnose with accuracy.

Secondly, that both upper and lower respiratory tracts should be investigated, the commonest finding in children liable to coughs and colds being upper respiratory infection.

Lastly, that in addition to local treatment, successful results require attention throughout the period of childhood to health as a whole.

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LATENT PRIMARY TUMOURS.

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UNFORTUNATELY for pathologist and therapeutist alike, our knowledge of the factors influencing the extension of malignant disease is still very incomplete. Many of the phenomena of neoplastic dissemination are enveloped in obscurity. Of two histologically similar tumours, one may undergo rapid and prolific metastasis and the other tardy

metastasis or no metastasis at all. Neoplastic residues, local or metastatic, may remain quiescent for many years after extirpation of the parent tumour, and then may resume active growth. Many individual vagaries of distribution of metastatic growths are observed. Thus, while one case of breast cancer follows a familiar course, metastasizing to the lungs, liver or bones, another morphologically and topographically similar tumour will spare these favourite sites and will yield secondary deposits in "unusual" regions, such as the intestines, pancreas, adrenals or brain. The factors determining all these peculiarities of the metastatic process are as yet unknown.

Of more than usual practical interest are those primary tumours which remain insignificant and symptomless while producing prominent metastases. In such cases energetic treatment of a secondary growth is frequently carried out in the belief that it is the primary tumour. The object of this paper is to record some examples of symptomatically latent primary growths which I have observed at autopsies at the Austin Hospital for Chronic Diseases and at the Alfred Hospital. That diagnostic errors of this kind are decidedly frequent will be evident when it is stated that the cases described all occurred within a period of eighteen months and in a continuous series of only two hundred autopsies on unselected malignant cases of all kinds. Nor are these errors merely examples of the incomplete examination or the inadequate diagnostic equipment of general medical practice, for all of the following records concern patients investigated and treated, often for long periods, at various metropolitan general hospitals.

Latent Carcinoma of the Tongue.

Though the entire tongue is accessible to direct inspection, posterior lingual cancer may long remain inconspicuous, eluding careful search, while massive cervical metastases develop. Cases I, II, III and IV illustrate this event.

CASE I: Four years before death a man, aged fifty-six years, noticed a lump in the left upper cervical region. He attended hospital, where the growth was excised and a histological diagnosis of "endothelioma" of the cervical lymph glands was made. The tumour soon recurred and a second and a third operation were performed, with subsequent recurrence on each occasion. The patient was admitted to the Austin Hospital under the diagnosis of "endothelioma." Two and a half years from the beginning of his illness and eighteen months before death, he noticed slight dysphagia, and a small area of ulceration of the base of the tongue extending to the left tonsil was discovered. This enlarged slowly, as did also the cervical masses, and no improvement was obtained by deep X radiation or radium implantation. Autopsy revealed extensive ulceration of the left faucial region, base of the tongue and left pharyngeal wall. Massive deposits were present on both sides of the neck, but no visceral metastases were found. Histologically the tumour was an anaplastic non-cornifying epidermoid carcinoma. (This case was number XIV of a recent paper[1] on epidermoid cancer of the head and neck.)

CASE II was recorded in detail in a recent paper,[2] and only a brief outline is given here.

A female, aged fifty-eight years, noticed a mass in the left side of the neck. After competent examination at a metropolitan public hospital, a provisional diagnosis of "branchiogenic cancer" was made, and surgical excision was attempted, but had to be abandoned. The patient was admitted to the Austin Hospital under this diagnosis. The mass extended rapidly. A few weeks before death oral examination revealed a small mass in the base of the tongue. Autopsy disclosed total destruction of the thyreoid gland by the cervical tumour and an insignificant primary squamous-celled cancer of the tongue, which had been brought into prominence by compensatory hyperplastic enlargement of a subjacent accessory lingual thyreoid.

CASE III: A man, aged seventy-eight years, attended hospital early in 1930 with a huge mass of malignant glands on both sides of the neck. Careful examination of all cranio-cervical mucous membranes failed to reveal any primary growth. On admission to the Austin Hospital in May, examination of the mouth, pharynx and adjoining cavities again disclosed no evident primary tumour. The patient died in June, and even at autopsy the upper respiratory and alimentary passages apeared normal, and the thyreoid gland, which was partially incorporated in the massive cervical growths, was held suspect as the origin of the tumour. Histological examination, however, disclosed cornifying epidermoid carcinoma and further search of the preserved cervical viscera then revealed a flat, non-ulcerated area of induration, nine millimetres in diameter, in the centre of the base of the tongue. Microscopically, this proved to be the undoubted origin of the massive cervical tumours. One small metastasis was present in the right lung.

CASE IV: In December, 1929, a man, sixty years old, first noticed a small lump near the right angle of the mandible. This enlarged steadily and ulcerated in February, 1930. Examination at this time disclosed a firm mass, the size of a billiard ball, close to the angle of the jaw, fixed to the deeper structures, and with superficial ulceration of the skin. Oral and faucial examination revealed no abnormality, but no special investigation of the pharynx was made. The tumour was thought to be probably of parotid origin and surgical excision was performed in March. Microscopical sections exhibited prickle-celled epidermoid carcinoma. Two months later he noticed an increasing lump near the left mandibular angle. In September dyspnœic attacks appeared and the patient was readmitted to hospital in October. There was present a large, lobulated, hard tumour in the left side of the neck. Oral and faucial examination again disclosed no abnormalities. Death occurred early in November, 1930. Autopsy revealed a small malignant ulcer in the glosso-epiglottic recess extending deeply into the base of the tongue and involving the epiglottis. The fauces and tongue dorsum were uninvolved. Beyond the massive cervical deposits no other metastases were found.

These cases indicate the inadvisability of regarding obscure cervical tumours as primary neoplasms. Actually, endothelioma, primary sarcoma of lymphatic glands and branchiogenic carcinoma are pathological rarities, and even after histological study of biopsy material, they should not be accepted as serious clinical diagnoses. Every cervical glandular tumour calls for meticulous and repeated scrutiny of all cranio-cervical epithelial tissues, and no surgical attack should be made on such a tumour until exhaustive search has exonerated all mucous membranes and their glandular adnexa as the possible origin of the disease. Even then, as Case III illustrates, occasional mistakes will be made, but errors can be reduced to a minimum by rigid application of the above rules.

Latent Carcinoma of the Pharynx.

What we have just said of posterior lingual cancer applies also to pharyngeal growths, particularly to that type of tumour known as transitional-celled

carcinoma. This neoplasm, which arises most frequently in the naso-pharynx, is a non-cornifying anaplastic form of growth, the clinical and histological characters of which have been well presented by New[3] and by Quick and Cutler.[4] The primary lesion is usually a small infiltrating growth with little or no ulceration, while metastatic enlargement of the cervical lymphatic glands appears early and progresses to bulky tumours. Histologically these are often diagnosed as sarcoma. Frequently the inconspicuous primary growth eludes the most careful search for many months. Remote visceral metastases often appear. Case V exemplifies this type of tumour.

CASE V: A Chinese male, fifty-five years of age, first noticed a mass in the left side of the neck two years before death. He attended hospital where a provisional diagnosis of "lympho-sarcoma" of the cervical glands was made, and deep X radiation applied. The tumour steadily increased and in the last two months of life dysphagia and nasal obstruction appeared. Autopsy revealed an enormous cervical tumour which also invaded the basilar plate of the skull, irrupted into the pharynx, occluded the choanæ and destroyed the left tonsil and part of the soft palate. No remote metastases were found. Histologically the tumour was a transitional-celled carcinoma, consisting of diffuse masses of rounded and spindle cells with large, deeply staining nuclei and relatively scanty, ill-defined protoplasm. Sparse foci betrayed the epidermoid alliance of the growth, a feature also remarked by Ewing.[5]

It seems certain that this tumour was primarily of naso-pharyngeal origin and that the massive metastases had also secondarily irrupted into that cavity, obscuring the early topography of the lesions. (This case was number III in the paper already referred to.[1])

Emphasis must be placed on the importance of recognizing transitional-celled carcinoma. Particularly is this so since not only may the primary growth escape clinical detection, but biopsy specimens of the cervical metastases are often pronounced "endothelioma" or "sarcoma" by the examining pathologist. When dealing with obscure neck tumours, the pathologist must be alive to the possibility of that clinically elusive and histologically deceptive neoplasm, transitional-celled carcinoma.

Inconspicuous pharyngeal growths other than transitional-celled cancer may produce not only local, but also remote metastases which may dominate the clinical picture. Kaufmann[6] (page 824) records such an event in which an insignificant tumour of the pyriform recess produced numerous secondary tumours in almost every organ of the body.

Latent Carcinoma of the Œsophagus.

Like oral and pharyngeal growths, carcinoma of the upper half of the œsophagus may produce bulky lymphatic metastases in the neck, while primary œsophageal symptoms are absent. Kaufmann (page 646) gives two striking examples, in one of which the cervical mass was extirpated surgically in the belief that it was a primary tumour. Clinical precedence taken by remote metastases from œsophageal cancer is well exemplified in a patient recorded by Francke.[7] The clinical diagnosis was "cerebral tumour," but autopsy revealed an adenocarcinoma of the œsophagus with metastases in many organs, including the brain.

Œsophageal carcinoma frequently metastasizes to the liver and great enlargement of this viscus may occur while the primary growth remains unsuspected, as in the following example.

CASE VI: In December, 1929, a man, sixty-four years of age, first began to suffer from dyspnœa on exertion. He attended hospital, where examination revealed hepatic enlargement, and whence in May he was recommended to the Austin Hospital as suffering from "primary carcinoma of the liver." On admission the only clinical abnormality was gross enlargement of the liver, the lower edge of which reached the pelvis on the right side. The Wassermann test yielded no reaction. Death ensued the following month. Autopsy revealed a small ulcerating carcinoma of the œsophagus, three centimetres in length, just behind the bifurcation of the trachea to which the growth firmly adhered. Surrounding the cardia of the stomach was a large matted mass of glands, and discrete lymph glandular deposits were present also in the lesser omentum and along the upper border of the pancreas. The liver weighed 3,170 grammes (112 ounces); the right lobe was almost completely replaced by an irregular mass of growth, and many smaller metastases were present in the left lobe. Histologically the tumour was a cornifying squamous-celled carcinoma.

Without yielding metastases, clinically latent cancer of the œsophagus may cause dramatic results by perforating adjacent structures. Kaufmann (page 647) describes the sudden onset of fatal paraplegia, and following is an account of an even more dramatic ending.

CASE VII: For five months prior to death a man, forty-two years old, suffered from vague epigastric discomfort after meals. He had no actual pain, no vomiting and no dysphagia. Later he noticed aching pain in the right scapular region. He was admitted to hospital for investigation with a provisional diagnosis of peptic ulcer. Clinical examination elicited nothing abnormal in any part of the body. Skiagrams following a barium meal revealed no abnormality of the stomach or intestine, and a cholecystogram was normal. A fractional test meal disclosed total achlorhydria, but neither blood nor lactic acid was present. Blood counts and films were normal and the Wassermann test yielded no reaction. After four weeks' rest and dietetic treatment the patient was much improved, taking his meals well without discomfort. His discharge home was being contemplated, when one evening he was discovered dead in bed by a nurse with whom he had been chatting cheerfully a few minutes previously. Autopsy disclosed an ulcerating, non-stenosing growth involving two-thirds of the circumference of the œsophagus for ten centimetres of its length, with its upper limit just caudal to the bifurcation of the trachea. There was little peripheral invasion of the medisatinal tissues, but the growth infiltrated and had effected a pin-point perforation of the aorta. The stomach was distended by several pints of recent blood clot. The only metastasis found was a lymph glandular deposit on the greater curvature of the stomach in the omental attachment. Histologically the neoplasm was a slightly cornifying squamous-celled carcinoma.

Latent Gastric Carcinoma.

Practical medicine frankly recognizes a group of symptomless cancers of the stomach (Osler[8]). Usually such tumours are situated in the body of the organ or near the cardia; pyloric growths rarely fail to produce symptoms. A latent gastric growth may be discovered accidentally at autopsy, or prominent metastases, abdominal or remote, may have been regarded clinically as primary growths.

Advanced but unsuspected carcinoma of the stomach without remote metastases is exemplified in the following case.

CASE VIII: In March, 1930, at the Austin Hospital, a man, aged sixty-nine years, died of an enormous osteochondro-sarcoma of the femur of eighteen months' duration. He had had no symptoms referable to the gastro-intestinal tract. Autopsy revealed a pedunculated, highly papillary growth, seven centimetres in diameter, arising from the mucosa of the middle of the posterior wall of the stomach. The core and base of this apparent papilloma were hard and infiltrated, and this infiltration extended widely in the adjacent gastric wall. The organ exhibited characteristic gizzard thickening of most of its posterior wall and the upper part of its anterior wall. Several lymph glands along the lesser curvature contained deposits of growth. No other metastases were found. Histologically the tumour was a papillary adenocarcinoma, becoming more disorderly in structure in its pedicle. In the gastric wall and in the lymph glands the growth consisted of diffusely infiltrating spheroidal and signet-ring cells with scanty adenomatous grouping.

Prominent metastases from latent gastric cancer most frequently involve the liver. Kaufmann (page 712) mentions a patient in whom even exploratory laparotomy failed to detect a small cardia cancer which had produced prolific hepatic metastases, and states that he has seen many such cases. Elsewhere (page 967) the same author describes two cases of gastric carcinoma in which large cystic metastases in the liver were regarded clinically as hydatid cysts and were accordingly subjected, the one to exploratory puncture and the other to laparotomy. The following account further exemplifies massive hepatic enlargement from unsuspected cancer of the cardia.

CASE IX: A man, aged sixty-eight years, was admitted to hospital in August, 1930, complaining of asthenia and dyspnœa on exertion for three weeks. Examination disclosed arteriosclerosis, gross enlargement of the liver which reached the level of the navel in the mid-line, and œdema of the legs. Skiagrams following a barium meal failed to reveal any abnormality of the stomach. The Wassermann test gave no reaction. Clinically the condition was regarded as arterio-sclerosis, hepatic cirrhosis and cardiac failure. Death occurred within three weeks and autopsy revealed an ulcerating carcinoma, three centimetres in diameter, on the posterior wall of the stomach near the cardia. The liver, which weighed 4,754 grammes (168 ounces), contained an irregular tumour almost completely replacing the right lobe. No other metastases were present. Histologically the growth was an anaplastic carcinoma with many mitotic figures.

Next to the liver, the ovaries are the favourite site of intraabdominal metastases from latent gastric tumours. The ovarian growths, nearly always eventually bilateral, may reach large dimensions and may be treated as primary carcinoma of those organs. Some of these neoplasms take the histological type known as Krukenberg tumours, the great majority of which are secondary to gastric, intestinal or mammary cancer. Bland-Sutton[9] was one of the first to stress the clinical importance of secondary carcinoma of the ovaries, emphasizing the frequency of unsuspected primary growths in the gastro-intestinal tract. Kaufmann (page 1579) states that in many cases of Krukenberg tumours he has predicted the existence of an occult primary carcinoma of the stomach and that this opinion has frequently been confirmed at autopsy. We will return to the subject of secondary ovarian neoplasms when discussing cancer of the colon.

Another misleading form of intraabdominal metastasis from gastric growths is the so-called Douglas implantation metastasis in the recto-vesical or recto-uterine pouch. This may mimic a primary stenosing carcinoma of the rectum, an event referred to by Dann[10] and by Boas,[11] among others.

Remote extraabdominal metastases may be the first indication of symptomless cancer of the stomach. In Tilling's case[12] a metastasis in the humerus was the first evidence of the disease. Finlay[13] described a patient with widespread subcutaneous nodules, biopsy sections of which unexpectedly disclosed columnar-celled adenocarcinoma. Subsequent autopsy revealed cancer of the cardia of the stomach, with widespread metastases.

Troisier's sign, namely, enlargement of the supraclavicular lymph glands by metastasis from abdominal growths, has at times been an early finding in latent gastric cancer, and histological examination of an excised gland may establish the presence and origin of malignancy in otherwise obscure cases.

Latent Carcinoma of the Intestine.

Unsuspected carcinoma of the colon shares with gastric cancer the propensity for producing prominent metastases, sometimes in the liver and sometimes in the ovaries. The following case illustrates the first event.

CASE X: A woman, sixty-five years old, was admitted to hospital in August, 1930, complaining of flatulent indigestion for three years and of abdominal swelling and dyspnœa for seven weeks. She had also had frequent vomiting attacks recently and had lost much weight. The bowels were regular. Examination disclosed slight icterus, prominent irregular enlargement of the liver, a palpably enlarged spleen, free fluid in the abdominal cavity, and œdema of the lower limbs. The patient became rapidly worse and died three days after admission. The clinical diagnosis was cardiac failure, though it was thought possible that a gastric carcinoma might also be present. Autopsy revealed an ulcerating carcinoma of the sigmoid colon, with small satellite nodules in the adjacent peritoneum. The liver weighed 4,245 grammes (150 ounces) and was studded with numerous metastatic tumours, and the portal lymph glands were involved. Histologically the tumour was a typical columnar-celled adeno-carcinoma.

Metastatic growths in the ovaries, already referred to in discussing gastric cancer, are not infrequent in cases of carcinoma of the colon, and may take a prominent place in the symptomatology of the disease. Case XI affords a striking example of this sequence.

CASE XI: In January, 1928, a woman, thirty-nine years of age, first began to suffer from intermittent abdominal pain and constipation. Later she attended hospital where, in December, 1928, laparotomy was performed and a huge partly-solid, partly cystic tumour of the right ovary was removed. Because the colon was much dilated, attributed to mechanical pressure on the rectum by the ovarian mass, caecostomy also was performed. Though searched for, no primary lesion of the bowel itself was discovered. Histologically the growth was a columnar-celled papillary adenocarcinoma. As the caecostomy opening, after closing, broke down again and continued to discharge intermittently thereafter, the patient was transferred to the Austin Hospital in March, 1929, under the diagnosis of

"malignant ovarian cyst." Her subsequent course was one of intermittent attacks of abdominal pain and distension and progressive loss of weight. She died in July, 1929. Autopsy revealed a carcinomatous stricture of the sigmoid flexure of the colon, two centimetres long, scattered peritoneal deposits of growth, hepatic metastases, and the left ovary replaced by a solid spherical tumour five centimetres in diameter. Histological examination of all these lesions revealed columnar-celled carcinoma identical in structure with that seen eighteen months earlier in the right ovarian tumour.

Although the primary tumours in the following two cases were not latent, but were known clinically to be in the colon, metastases to the ovaries were such a striking feature that brief *résumés* are appropriate here.

Mrs. L., aged thirty-nine years, attended hospital in August, 1928, with an attack of subacute intestinal obstruction. After preliminary caecostomy, radical removal of a stenosing carcinoma of the sigmoid colon was performed. For the ensuing two years the patient remained in good health, but in August, 1930, she noticed a lower abdominal swelling and returned to hospital. At operation a huge multilocular cystic tumour of one ovary was removed. No recurrence of the former intestinal growth was discoverable, and the surgeon was uncertain whether the ovarian neoplasm was metastatic or was of independent ovarian origin. Histologically, however, the growth proved to be a columnar-celled adeno-carcinoma identical with and clearly secondary to the colon cancer excised two years previously.[1]

Mrs. Z., forty-six years of age, began in December, 1928, to suffer from attacks of abdominal pain with vomiting and constipation. One month later she attended hospital and laparotomy revealed a hard ring carcinoma of the ascending colon and several enlarged adjacent lymph glands. Radical excision and anastomosis of the ileum and transverse colon were performed. The patient was discharged in good health a month later. In April, 1929, however, she was readmitted complaining that she had recently noticed a lump in the hypogastrium. Laparotomy was performed and a large left ovarian tumour removed. Two hard glands were felt in the mesentery near the entero-colostomy. It was noticed that the right ovary was normal. After deep X radiation the patient again left hospital in good health. For the ensuing twelve months she remained well, but in June, 1930, lower abdominal swelling was again noticed and she was readmitted to hospital. Laparotomy disclosed a large right ovarian tumour, which was removed. Three weeks later the patient was again discharged in good health. Histologically the intestinal and both ovarian tumours exhibit columnar-celled adeno-carcinoma of identical structure.

The foregoing accounts serve to impress the emphatic advice of Bland-Sutton with respect to malignant tumours of the ovaries.[14] The following surgical rules might well be formulated: (i) The discovery of any malignant ovarian tumour calls for special scrutiny of the gastro-intestinal tract for a possible primary growth, and (ii) when a malignant growth of the ovary is extirpated, the opposite ovary, even though seemingly healthy, should also be removed.

Latent Carcinoma of the Kidney.

Carcinoma of the kidney, especially the common clear-celled papillary adeno-carcinoma, frequently but misleadingly called "hypernephroma," is notorious for its propensity for producing prominent metastases, particularly in bones, and there are numerous recorded cases of secondary growths from latent renal cancer having been treated as primary skeletal tumours. Valuable accounts of this subject are given by Joll[15] and by Rost,[16] and a number of illustrative cases will be found in the *Proceedings of the Royal Society of Medicine*, 1919-1920.[17]

The two following cases may be cited as examples of the prolonged dormancy of renal carcinoma while metastases were subjected to active treatment in the belief that they were primary tumours. The second case is remarkable for the unusual situation of the supposed primary growth.

CASE XII: In November, 1929, a male, thirty-two years of age, began to suffer from pain in the left hip. This steadily became worse and later a swelling appeared in this region. On admission to hospital in February, 1930, there were present general hard enlargement of the left ilium, a firm rounded tumour of the left fourth rib near the nipple line, and obvious general cachexia. The skiagraphic report was: "Large area of bone destruction in the left wing of the ilium; some destruction also present in the neck of the femur; no osteo-sclerosis present; suggests sarcoma." The Wassermann test gave no reaction. Intensive deep X radiation of the pelvic growth effected no improvement, the tumour steadily increasing in size. The patient was admitted to the Austin Hospital in March under a diagnosis of sarcoma of the ilium, with metastases in lungs and ribs. Further skiagrams at this institution appeared to confirm this diagnosis, the radiologist's report being: "Large bony sarcoma infiltrating the whole of the left *os coxæ* and also the upper end of the left femur." Death occurred in March, 1930. Autopsy disclosed a yellow tumour replacing the upper half of the right kidney; a large growth destroying almost the whole of the left ilium and pubis, similar deposits in the head and neck of the femur and in the fourth left rib, and metastatic growths in the lungs, mediastinal glands, liver and left kidney. Histologically all of the tumours exhibited the characteristic structure of clear-celled papillary adeno-carcinoma of the kidney.

Case XIII: In May, 1929, a man, aged fifty-six years, first noticed a lump in the right side of the neck, and a few weeks later sore throat and dysphagia appeared. In July he attended hospital and firm enlargement with central ulceration of the right tonsil was discovered. A diagnosis of malignant disease of the tonsil with cervical metastases was made, and in August radium needles were buried in the tonsil and a radium pack applied to the neck. Thereafter the tonsil healed completely and there was diminution of the cervical mass, but a sloughing area of ulceration appeared in the lower part of the neck and refused to heal. This was regarded as a chronic radium burn. At the end of May, 1930, he was admitted to the Austin Hospital, where he died early in July.

The autopsy findings were as follows: There was a large necrotic area in the right side of the neck exposing the sterno-mastoid and the trapezius muscles, the lateral surface of the thyreoid gland and the clavicle, the medial part of which was necrosed. The right lobe of the thyreoid was extensively infiltrated by hard white tumour tissue which was also present elsewhere in the walls of the ulcer and in the adjacent right cervical lymph glands. The scalp of the right parietal area contained a flat plaque of tumour. The right tonsil was small and slightly scarred, but there was no sign of any local neoplasm. The pharynx, tongue, œsophagus and trachea were normal. Both lungs contained a few small scattered growths and the right hilar and anterior mediastinal lymph glands were affected. Suppurative pericarditis was present, evidently by lymphatic extension from the closely adjacent necrotic ulcer in the base of the neck. Several small tumours were present in the myocardium. The parietal and visceral peritoneum exhibited a few nodules of growth. The liver and spleen were not involved. The right kidney contained numerous scattered tumours up to 1·5 centimetres in diameter. The left kidney weighed 962 grammes (34 ounces) and was largely replaced by a firm white tumour, and the adrenal gland was infiltrated by tumour

[1] This patient has since died; and a large metastasis of the remaining ovary was present.

tissue from the adjacent kidney. The right adrenal contained a discrete metastasis. The bladder, prostate and testes were normal. The cœliac and lumbar glands were the seat of large confluent tumour deposits, and the pancreas also was infiltrated. The brain contained a small tumour 1·5 centimetres in diameter in the right caudate nucleus. Most of the lesions enumerated were studied microscopically, and the tumour tissue was similar in all situations, consisting of disorderly masses of polyhedral cells with clear cytoplasm. Here and there a tendency to papillary arrangement was evident.

These characters and the presence of the large left renal neoplasm left little doubt that the case was one of anaplastic but latent carcinoma of the kidney with widespread metastases. It must be concluded that the early clinical features of the illness, namely enlargement of the cervical lymph glands and ulceration of the tonsil, were due to metastases in those structures, and that these were affected beneficially by the radium treatment applied in the belief that the tonsil was the origin of the disease. Not the least surprising aspect of the case was the absence of all clinical symptoms of the large renal and retro-peritoneal tumours which were present.

Latent Carcinoma of the Lung.

Of recent years there has been increasing recognition of the bronchial origin of the majority of pulmonary carcinomata and also of many growths presenting the clinical picture of mediastinal tumours. Many cases have also been recorded in which small unsuspected bronchial growths have produced prominent remote metastases, particularly in bones and the brain. Kaufmann (page 475) tells of a patient whose condition was diagnosed clinically as primary cerebral tumour and who was operated on accordingly; the brain contained multiple metastases from an unrecognized lung carcinoma. Case XIV is an example of rapid widespread metastases from an occult lung cancer, and Case XV is an instance of unusual diagnostic difficulties occasioned by a latent primary tumour of probable pulmonary origin.

CASE XIV: A man, aged sixty-four years, first began to suffer from asthenia and indigestion in April, 1930. At a public hospital examination revealed gross irregular hepatic enlargement, a separate left epigastric mass, and an enlarged left supraclavicular gland. The condition was diagnosed as "carcinoma of the stomach with metastases in the liver," and the patient was admitted to the Austin Hospital. Here the only additional abnormality noted was the presence of numerous small subcutaneous nodules over the neck, back and abdomen. Death occurred near the end of May, only six weeks after the first onset of symptoms. Autopsy revealed the following abnormalities. There were many small subcutaneous nodules of growth in the neck and trunk. The left lung presented an infiltrating growth of the hilus with deposits in the adjacent bronchial glands. The bifurcation of the trachea was enveloped in a mass of involved glands. The right bronchial glands also were affected, but the right lung was intact. One small metastasis was present in the left ventricular myocardium. The liver weighed 3,156 grammes (120 ounces) and was thickly studded with growths. The spleen contained several small nodules up to six millimetres in diameter. The mesentery presented a number of plaques of growth. The kidneys, adrenals, pancreas, alimentary canal, bladder and testes were uninvolved. The prostate was hard and nodular and adhered to its capsule. The intracranial contents were normal. The thyreoid presented no abnormality. Microscopical examination of the various growths disclosed a similar structure throughout, namely, anaplastic epidermoid carcinoma with numerous mitoses. At autopsy it had been difficult to decide with certainty whether the primary site of the neoplasm was prostate or lung. The epidermoid character of the carcinoma, however, and also the observation that the prostate exhibited only incomplete and patchy malignant infiltration of otherwise normal prostatic tissue, indicate the bronchial origin of the tumour.

CASE XV: A woman, aged thirty-two years, first began to suffer with pain and weakness in the lower limbs in December, 1929, and was admitted to a public hospital in March, 1930. A skiagram revealed collapse of the fifth lumbar vertebra. Soon afterwards fæcal and urinary retention developed, followed later by a severe purpuric attack with bleeding gums, melæna, menorrhagia and purpuric rash. This improved and the patient was transferred to the Austin Hospital in June under the diagnosis of "spinal tuberculosis with paraplegia; recent acute hæmorrhagic purpura." Examination on admission revealed a pale asthenic woman with no sphincter control and with neurological signs of *cauda equina* compression. The heart, lungs and abdominal organs presented no clinical abnormalities. Blood examination gave red corpuscles 3,060,000 per cubic millimetre, leucocytes 6,200 with normal differential count, platelets 150,000, hæmoglobin 50%, colour index 0·8; anisocytes, poikilocytes and polychromasia of the red blood cells; bleeding time twenty minutes, coagulation time twelve minutes. The Wassermann test yielded no reaction. Skiagrams revealed extensive destruction of the sacrum, both ilia, the ninth and tenth dorsal and fifth lumbar vertebræ, with total collapse of the last bone. During the ensuing three weeks there was persistent oozing of blood from the gums, and as the anæmia became worse, a transfusion of blood was given. Very troublesome bleeding then occurred from the transfusion wound. On July 11 the patient became suddenly unconscious and died a few hours later.

The autopsy findings were as follows: Both lungs contained very small scattered nodules of growth, with a larger tumour nearly two centimetres in diameter near the apex of the left lower lobe. The bronchial glands contained tumour deposits. The liver was large and fatty, but contained no tumour deposits. The spleen, adrenals, kidneys, pancreas, pelvic organs and alimentary canal were normal, but the contents of the intestine was deeply blood stained. The upper respiratory and alimentary passages and the thyreoid gland were normal. The cerebral meninges were infiltrated by recently extravasated blood. The brain was unusually soft and presented a hæmorrhage in the left frontal pole, and an area of tumour infiltration in the white matter of the left parietal lobe. The vertebræ from the fifth cervical down to the tenth dorsal and also the lower lumbar vertebræ were infiltrated by tumour tissue and the bone rarefied and friable. In places the spinal canal was occupied by hæmorrhagic soft *débris*. The pelvic bones were involved similarly to the vertebræ. The ribs and skull were normal. Other bones were not sectioned. Microscopical study of the tumours in the lungs, bronchial glands, spine and brain disclosed everywhere the structure of adeno-carcinoma with plump columnar or cuboidal cells lining large irregular acini or covering available surfaces in extensive sheets.

The definite epithelial character of the tumour compels the conclusion that its origin must have been the lungs, which were the only epithelial organs involved. The presence of one tumour larger than others in the left lung and the involvement of the bronchial lymph glands serve to confirm this conclusion. The possible relationship of the extensive bone destruction to the severe purpuric state of the patient, though of much interest, is beyond the scope of this paper.

Latent Carcinoma of the Breast.

Despite its accessibility to examination, mammary carcinoma occasionally remains clinically unrecog-

nized, while yielding widespread metastases. Kaufmann (page 1800) records several examples and the following *précis* account of a remarkable case, published in greater detail elsewhere,[18] illustrates the same event.

CASE XVI: In March, 1929, a woman, fifty-eight years old, began to suffer mental deterioration, a change of facies, and an increase of weight, and later a lump appeared in the skull. As she had undergone radium treatment two years previously for a carcinoma of the vulva, she was admitted to the Austin Hospital on the supposition that metastases of this tumour had appeared. On admission in June, 1929, there was no sign of local recurrence of the vulval growth, and the only clinical abnormalities noted were general obesity and coarse facial features, mental apathy and amnesia, non-control of the sphincters, and a firm hemispherical mass attached to the right parietal bone. Autopsy six weeks later revealed an inconspicuous, deeply situated carcinoma of the right breast, five centimetres in diameter, with metastases in the lungs, heart, kidneys, pancreas, intestines, liver, dura, brain and thyreoid gland. The last organ was almost completely replaced by growth and the mental changes, facial alteration and increase in weight recorded in the clinical story were doubtless myxœdematous manifestations. Histologically the tumour was an anaplastic carcinoma.

Latent Tumours of Other Organs.

Prostatic cancer may remain symptomless while yielding secondary growths in bones and other structures. I have known of tumours regarded clinically as sarcoma of the femur and proved at autopsy to be metastases from carcinoma of the prostate. Lundsgaard[19] records a remarkable instance in which a large mass in the neck, extirpated as a primary sarcoma, proved to be a metastasis from a prostatic adeno-carcinoma.

Dormant carcinoma of the thyreoid, a frequent source of metastases in bones, did not occur in the series under review. Excellent accounts of the subject, with many references, are given by Joll[15] and illustrative cases by Connell[20] and by Levin.[21] An instructive example was recorded recently by Rosenthal and myself.[22]

Finally, mention must be made of certain less common tumours which may occasion the kind of errors under discussion. Inconspicuous ocular or cutaneous melanomata, and also testicular and adrenal growths, may yield massive distant metastases. Remarkable amongst adrenal neoplasms are those in children, of the kind described by Hutchinson, with predominant secondary growths in the skull,[23] and those described by Pepper with bulky hepatic metastases.[24]

Summary and Conclusions.

In the last two hundred autopsies on cases of malignant growths I have encountered sixteen cases (8%) in which the primary tumours eluded clinical detection. All of these patients had been investigated and treated at metropolitan public hospitals. In seven instances special surgical or radio-therapeutic attack was directed against secondary growths, believed clinically to be primary tumours, surgical excision being attempted in four cases, in one of which (Case I) three separate operations were performed.

The following conclusions possess little originality, but may serve to direct more attention to certain weak points in our diagnostic system.

1. Malignant masses of obscure nature in the neck, the leading symptom in six of this series, should always be regarded as metastatic in origin and repeated expert search of all cranio-cervical epithelial surfaces for the primary growth should be prosecuted. "Lymphosarcoma," "endothelioma" and "branchiogenic carcinoma" should be tolerated neither as clinical diagnoses nor as final histological findings on surgical material. Further, it must be remembered that prominent cervical tumours may owe their origin to remote primary growths, as in Case XIII, from carcinoma of the kidney.

2. Given no reaction from Wassermann and Casoni tests, enlargement of the liver, the main clinical feature in four of the cases described, should arouse constant suspicions of a latent primary growth in some part of the alimentary canal, including the œsophagus. Hepatic enlargement may, however, be due to metastasis from a latent growth elsewhere, as in Case XIV, from the lung. "Primary carcinoma of the liver" is a very precarious clinical diagnosis.

3. Malignant tumours of one or both ovaries are not infrequently secondary to primary growths elsewhere, particularly in the gastro-intestinal tract. When contemplating surgical removal of a malignant ovarian tumour, careful search for such a primary neoplasm should first be made. Since malignant growths of the ovary, both primary and secondary, frequently become bilateral, the operation of choice for even an apparently unilateral tumour is double oophorectomy.

4. The clinical and skiagraphic diagnosis of "primary sarcoma of bone" is erroneous in an important proportion of cases. The skeleton is a frequent seat of metastases from latent carcinoma, especially of the kidney (my Case XII), thyreoid gland, prostate and lung (my Case XV), and many such patients receive drastic treatment of the supposed primary skeletal growths. A final diagnosis of "sarcoma" of a bone should be made only after special investigations regarding the condition of the kidneys, thyreoid gland and other favourite "dormant" sites.

5. Even after the most thorough purposive search, some primary neoplasms will escape clinical detection and careful autopsy will be the only available means of reaching a correct diagnosis. This probably applies to Cases III, XIV and XV of this series.

6. Finally, if such a large proportion of errors occurs in major public hospitals where every diagnostic facility is available and patients are under perpetual skilled observation, how much more erroneous must be the "causes of death" recorded by the average general practitioner! Arguments based on Government statistics seldom allow for the very great percentage of error which must be present. For accurate scientific purposes the only

mortality statistics worthy of serious consideration are those obtained from complete autopsy records with histological confirmation of the nature of all essential lesions present.

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THE OCHSNER-SHERREN DELAYED TREATMENT OF NEGLECTED APPENDICITIS.[1]

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Is the diagnosis of acute appendicitis an unqualified justification for immediate operation? When the inflammation is confined to the appendix itself, the answer is undoubtedly yes. However, there is a growing school of thought which considers that after the first forty-eight hours certain cases, later to be defined, are fraught with less danger of complication and death, if the patients can be tided over the acute stage, and nature assisted with the process of establishing an active immunity and shutting off the infection.

Most of us have witnessed the tragedy of conversion of a localized abscess into a general peritonitis. Surgical intervention would appear to be particularly dangerous between the third and fifth days. At this period the patient's natural immunity is exhausted and acquired immunity not yet fully established. If adhesions are broken down and fresh planes are opened up to infection during this negative phase of immunity, the patient may be unable to resist the additional strain on the protective mechanism. Leucocyte counts show that it is not until about the sixth day that any marked leucocytosis occurs.(1) It is in these cases that the Ochsner-Sherren treatment which is essentially a surgical preparation for operation in neglected cases of appendicitis, is most valuable. It has never been recommended as treatment for all cases of appendicitis. When that surgical Utopia has arrived when all cases of appendicitis are operated on within the first twenty-four hours, there will be no need for temporizing treatment.

Love, of the London Hospital,(1) states:

> It is a treatment only to be adopted with a full understanding of the indications and contraindications, and only in hospital, and on the threshold of an operating theatre, as operation must be undertaken immediately any of the contraindications to the continuation of the treatment appear.

Hamilton Bailey(2) writes:

> Not even its most ardent supporters would attempt to deny that the delayed treatment is open to abuse, and if abused, would defeat the very object of its inception. Just as we believe that its universal adoption under proper conditions would help to reduce mortality, so we freely admit that its misinterpretation would prove disastrous. Evil lies in the abuse of all good things.

[1] Read at the first annual reunion of the Royal Prince Alfred Hospital Residents' and Ex-Residents' Association, October 7 to 11, 1930.

As regards the mortality at different periods from onset, Love found the mortality in 2,000 cases as follows: Second day, 2·8%; third to fifth day, 10·2%. After the fifth day the mortality rapidly diminished. Owen (quoted by Love) reported 708 third day cases, with a mortality of 10·7%. Statistics of the Royal Prince Alfred Hospital, analysed by the author in 1,150 cases, also confirm this. Seeing is believing, and the author has had the privilege of seeing this treatment carried out at the London Hospital with marked success and a gratifying reduction in mortality.

Management of Patients for Ochsner-Sherren Treatment.

A careful history should be taken, noting the time in hours since onset. The area of rigidity should be carefully charted and dimensions of any mass exactly recorded for future reference. Hyperæsthesia should be looked for, as it indicates that the appendix is probably unruptured. Rectal examination should never be omitted.

If the time since onset is over fifty hours, it is justifiable to adopt the treatment unless: (i) Hyperæsthesia is present—good evidence that the appendix is still unruptured. (ii) The age of the patient is under five years or over sixty years. At the extremes of life the resistance to infection is poor. (iii) The differential diagnosis is difficult. There may be some other abdominal catastrophe. (iv) General peritonitis has supervened. (v) A powerful purgative has recently been ingested.

Treatment.

1. Water only is given by mouth until the temperature is normal.

2. Drugs are interdicted, especially purgatives and morphine or its derivatives.

3. An hourly pulse chart is kept. The temperature may be taken every four hours, and is not nearly so important.

4. The high Fowler position is adopted in bed, with the head of the bed raised.

5. The bowels should be left confined, unless naturally opened. After four or five days a small glycerine enema may be given.

Pain, as distinguished from tenderness, is rarely complained of after the first twenty-four hours of the treatment.

The nurses should be specially instructed in the treatment and should report at once: (i) Rising pulse rate, (ii) vomiting, (iii) pain, (iv) diarrhœa, especially with mucus (suggesting a pelvic abscess).

The rising pulse rate is the strongest indication that the treatment is not succeeding and that operation is necessary.

When a tumour is present the abscess should be drained if: (i) The tumour is not diminishing in size after five days. (ii) If the tumour is increasing in size under observation. (iii) The temperature is swinging over 37·8° C. (100° F.) for several days. (iv) If fluctuation is present. (v) If a pelvic abscess is heralded by diarrhœa with mucus. If a soft mass can be felt *per rectum*, it should be opened into the rectum. A posterior colpotomy is indicated in the female.

If the inflammation settles down under the treatment (as do the great majority), the question when to remove the appendix arises. About two or three months later would appear to be the consensus of opinion, with this proviso, that the patient reports immediately any recurrence of symptoms.

Hamilton Bailey[2] found that about 5% of patients failed to return for the operation until he made them all sign a card:

> I realize that I have been tided over an attack of appendicitis. The surgeon considered that in my case it was safer to defer operation. I fully understand the danger of leaving the appendix and I agree:
>
> 1. To come into hospital on (date).
> 2. To report immediately if I have any symptoms before that date.

"Ubi pus exeat" is a well established axiom, but with swellings in the right iliac fossa of moderate size, often largely omentum, but with variable amounts of pus, the Ochsner-Sherren treatment wins its most brilliant successes. Hamilton Bailey says:

> I find that to most of my assistants the resolving of an appendix abscess and the eventual operation and demonstration of the comparatively normal looking appendix is a surgical astonishment second to none.

The treatment is no great hardship to the patient, but does involve much responsibility and moral courage on the part of the surgeon. The patient must be very carefully watched in hospital under the ideal conditions laid down.

Medical and even lay education is such that it is difficult, after making a diagnosis of appendicitis, to take the stand of "masterful inactivity."

If the patient dies following operation, after trial has been given to expectant treatment and failed, it is apt to be regarded as a tragedy. Whereas, if death occur following immediate operation, it will be held that everything possible has been done, and the result taken philosophically.

Late cases with general peritonitis are a difficult problem and a high mortality is inevitable, whatever treatment is adopted. However, if the patient's condition is still good, appendicectomy should be done, if a not unreasonable amount of shock and trauma be inflicted. Mere drainage of the peritoneal cavity, without removal of the constant stream of infection, is very disappointing as a rule.

Patients with generalized peritonitis whose condition is bad, may be given a trial on the expectant treatment and some bad cases will be found to resolve or localize.

Antigas gangrene serum appears to help these patients and reduce the mortality.[3]

James Sherren, at London Hospital, who was responsible for the introduction and modification of the original Ochsner treatment, said:

> After twenty years' experience the only change I have made has been to greater conservatism and more patience in dealing with cases of appendiceal abscess.

Love[1] states:

I anticipate the day when the rule of thumb surgeon who operates on every case of appendicitis as soon as he sees it, will be as out of date as the physician who, in years gone by, treated perityphlitis by purgatives and enemata.

Herewith are some figures taken from articles by Love[1] and Hamilton Bailey,[2] and also from the Royal Prince Alfred Hospital records. Love[1] gives a comparative analysis of over 3,000 cases of appendicitis over forty-eight hours.

OCHSNER-SHERREN TREATMENT.

Hospital.	Number of Patients.	Died.	Mortality.
London	341	12	3·5%
St. Thomas's	214	9	4·2%
Manchester..	52	3	5·7%
TOTAL	607	24	3·8%

IMMEDIATE OPERATION.

Hospital.	Number of Patien's.	Died.	Mortality.
London	1,667	98	5·8%
St. Thomas's	901	76	8·4%
Manchester..	128	6	4·6%
TOTAL	2,706	180	6·7%

Hamilton Bailey[2] quotes 315 personal cases as follows: 242 immediate operation, four deaths; 73 Ochsner-Sherren treatment, one death.

From the records of the Royal Prince Alfred Hospital a large number of cases had to be discarded because of insufficient data from which to classify them. However, from 1,150 cases analysed many interesting facts emerge. These cases are not consecutive *in toto*, but are consecutive in each of the three series, and are grouped as:

A. Uncomplicated acute appendicitis
B. Appendicitis with abscess
C. Appendicitis with general peritonitis

} At time of operation.

The figures for the Royal Prince Alfred Hospital bear out those quoted earlier, namely, the much higher mortality to be expected after forty-eight hours. It will be noted that the average time in days from onset of symptoms is 2-3-6 for uncomplicated acute appendicitis, general peritonitis and appendiceal abscess respectively. Especially interesting is the series of patients returning up to seven years later with a second appendiceal abscess, three of whom lost their lives.

This stresses the importance of urging patients to return to hospital for appendicectomy after they have been tided over the emergency of an appendiceal abscess (199 cases in this series had no appendicectomy performed).

ROYAL PRINCE ALFRED HOSPITAL RECORDS. 1,133 CASES.

Cases.	Average Days from Onset.	Deaths.	Percentage Mortality.	Remarks.
				Uncomplicated Acute Appendicitis.
495	2	5	1·2	One died of pylephlebitis. One refused operation; settled down and discharged from hospital. One advanced pregnancy; settled down and discharged from hospital.
				Appendiceal Abscess.
597	6	35	6·9	Mass present in 236 cases. One patient, mass disappeared in twelve days; discharged from hospital. One patient, mass disappeared in ten days; appendix removed. One refused operation. One left hospital against medical advice. Two died of pylephlebitis. Two died of subphrenic abscess. 199 cases, the abscess was drained, appendix not removed. Eight patients had previous appendiceal abscess drained, from one to seven years previously. Three of this series died with their second appendiceal abscess, and still retaining their appendix.
				Appendicitis with General Peritonitis.
130	3	40	31	One died of pylephlebitis. Mass present in fifteen cases.

Acknowledgement.

My thanks are due to Dr. W. A. Bye, Superintendent of Royal Prince Alfred Hospital, by whose courtesy I had access to the records, and to Dr. Cecil Purser for permission to use them for this article.

References.

(1) R. J. McNeill Love: "Hunterian Lecture on the Treatment of Some Acute Abdominal Disorders," *The Lancet*, February 23, 1929, page 375.
(2) Hamilton Bailey: "The Ochsner-Sherren (Delayed) Treatment of Acute Appendicitis: Indications and Technique," *The British Medical Journal*, January 25, 1930, page 140.
(3) B. W. Williams: "The Importance of Toxæmia due to Anærobic Organisms in Intestinal Obstruction and Peritonitis," *The British Journal of Surgery*, Volume XIV, 1926-27, page 295.

Reports of Cases.

POST-VACCINAL ENCEPHALOMYELITIS.

By LIONEL LOCKWOOD, M.D. (Melbourne),
Surgeon Lieutenant Commander, Royal Australian Navy.

IT would appear that some apology is needed to report a case which occurred over five years ago; but, first, in view of the tremendous interest shown in the above subject during the past few years and, secondly, the fact that to the writer's knowledge no case has as yet been reported in Australia, there seems to be some justification for so doing.

L.M., stoker, aged nineteen years, was admitted to Flinders Naval Hospital on May 19, 1925, complaining of headache, drowsiness, pain in the chest and general malaise. On examination, temperature was 38·9° C. (102° F.), pulse 110, respiration 20, and there was nothing

abnormal found except moist sounds at the base posteriorly. He had been vaccinated on May 7, 1925, twelve days before the onset of the symptoms, and there was a marked positive reaction. He was put to bed. The condition remained *in statu quo* until May 25, when he complained of severe abdominal pain, not localized, but of a shooting character and becoming worse. His tongue was furred and dry, hectic malar flush was present, and the patient developed dry retching. Temperature was 37·8° C. (100° F.), pulse 92, respiration 22, and the chest seemed clear. On May 26 the temperature was 38·9° C. (102° F.), pulse 100, respiration 19. This day the patient developed complete loss of all forms of sensation, and flaccid paralysis in both legs and lower part of the abdomen below the umbilicus, and incontinence of urine and fæces. Deep reflexes were lost in both lower limbs. On May 27 he looked very ill, with cyanosis and other signs and symptoms of bronchopneumonia, namely, cough, dyspnœa, numerous râles in both lungs and signs of patches of consolidation. This condition continued until June 2, when delirium ensued. Dyspnœa increased and the condition became progressively worse. On June 7 the temperature rose as high as 40·5° C. (105° F.) and the patient died. No ocular phenomena were noticed at the time.

At that time (1925) the diagnosis was bronchopneumonia and myelitis. However, in view of our further knowledge of this condition, it now appears that the condition was one of post-vaccinal encephalomyelitis. It is to be regretted that the clinical notes are not fuller.

Comment.

According to Brain and Strauss, "symptoms indicating involvement of the nervous system appear between the ninth and nineteenth day after vaccination." It seems that the bronchopneumonia in this case was an intercurrent infection. It is one of the common modes of death. Brain and Strauss[1] give figures showing the mortality among 62 English cases in 1922-1923 as 58%. They say:

> There exists a close correspondence between the incidence of post-vaccinal encephalitis and the prevalence of vaccination. The hypothesis of the activation of a neurotropic virus by the virus of vaccinia is one which at present seems best to explain all the known facts of post-vaccinal encephalitis (and myelitis). We conclude that neither the virus of *encephalitis lethargica* nor that of poliomyelitis is responsible for post-vaccinal encephalitis.

It may be noted that the clinical and pathological pictures of *encephalitis lethargica* and poliomyelitis are altogether different from those of post-vaccinal encephalomyelitis. The pathological picture of this condition is one of perivascular inflammatory infiltration of the brain and spinal cord. In the white matter the vessels are often surrounded by conspicuous zones of demyelination, that is, loss of myelin sheaths.

Ledingham[2] writes:

> The histology of the nervous system is characterized by one very important lesion, that of perivascular demyelination, which is common to the encephalitis following measles, to the myelitis occurring at times in the course of antirabies treatment.

And again:

> The period after vaccination at which nervous symptoms begin in such cases is remarkably constant, and much has been made of this by the very few who regard the vaccine virus as alone responsible. I take the view that the apparent constancy of this period may fit equally well with a theory which presupposes some latent neurotropic virus in the vaccinees to be activated by vaccinia.

Practically all of these cases have been primary vaccinees at about school age. Primary vaccination at infancy appears to protect against such accidents in later vaccinations. Ledingham also writes:

> The experience with regard to post-vaccinal nervous sequelæ, rare though these be, offers a strong argument for the recommendation of infancy as the time of election for primary vaccination.

Similar nervous sequelæ have been reported after small pox, measles, chicken pox, scarlet fever, diphtheria, whooping cough and mumps.

References.

(1) Brain and Strauss: "Recent Advances in Neurology," page 282 *et sequentes*.
(2) J. C. Ledingham: *Proceedings of the Royal Society of Medicine*, February, 1929, page 512.

Reviews.

ŒDEMA.

"THE ŒDEMA OF BRIGHT'S DISEASE" is a somewhat misleading title for a book by Professor Achard, translated by Maurice Marcus.[1] In it the great French physician discusses œdema of all kinds—cardiac, renal and obstructive—and deals most thoroughly with the various aspects of causation, pathology and clinical manifestations and treatment.

After a short historical survey come the four parts into which the book is divided. Part I deals with anatomy and chemistry, Part II is clinical, Part III is devoted to pathogenesis and Part IV to treatment. A list of references appears after each part, but there is no index, the only bad feature in an otherwise admirable book.

In Part I we have the conception of the "lacunar system," as the author calls the connective tissue spaces. In these spaces is found the "lacunar fluid," whose main function is mainly concerned with the regulation of the body fluids, "owing to the ease of interchange between it and the blood, either diluting the substances which are in excess in the blood in its own elastic volume or else utilizing its own reserves, pouring out into the blood stream such substances as are needed." Œdema results from a disturbance of this function.

Dropsy may be defined as the effusion of serous fluid into the serous spaces and into the lacunar systems. Œdema is dropsy confined to the connective tissue.

The anatomy of the lacunar system is considered at some length, the lamellar conception being fully adopted. Then follows a chapter on the composition of dropsical fluids, showing that in the absence of any inflammatory condition they differ from both the blood pressure and the ordinary lymph of the lymphatic vessels, and more nearly approach the "ultra filtrates of the blood plasma" and most nearly resemble the cerebro-spinal fluid. The blood in dropsy has a special chapter and there is a great deal said regarding high cholesterolæmia in albuminuria, especially with reference to nephrosis.

Part II, clinical, is a model of descriptive writing. After the first chapter on generalized œdema comes one on œdema in special localities, including a most complete and vivid account of the cause, manifestations and treatment of acute pulmonary œdema.

Clinical types of nephritis are discussed and there is a very critical examination of Epstein's condition of nephrosis, which, after reviewal of the evidence, is accepted in a certain number of cases as a primary condition, though it is suggested that the nephritic type is really the sequel of a glomerulonephritis.

A chapter on chloride retention, body weight, urinary findings and arterial pressure completes the clinical section. The retention of chlorides is discussed at some length, but nowhere in this section is there any hint of the view now gaining ground that it is the sodium and not the chlorine radicle which is the important factor in salt œdema.

Part II deals with the various theories of œdema formation and incorporates among them Achard's own important work. The rôles of blood tissue fluids, capillary walls, kidney action and capillary pressure are scrutinized in succession and due weight is given to each.

Especially is this the case in the section dealing with electrolytes which gives a long and complete account of

[1] "The Œdema of Bright's Disease," by Ch. Achard, translated by Maurice Marcus, M.B., B.S.; 1930. London: Kegan Paul, Trench, Trubner and Company, Limited; Melbourne: W. Ramsay. Demy 8vo., pp. 242. Price: 9s. net.

their action in urinary excretion, with a most judicial criticism of the theory of renal threshold. In this section, too, is the only reference in the book to Blum's work on the importance of the sodium rather than the chlorine ion. Its especial importance is seen, of course, in treatment and in the explanation of those cases of "dry chloride retention" seen especially in chronic arteriosclerosis. The explanation is, of course, that chloride estimation is usually assumed to be the equivalent of sodium chloride. In these cases the chlorides may rise to 400 milligrammes per 100 cubic centimetres against a normal 330, but the sodium may fall to 240 from 330. A short summary of all the factors involved and their appropriate importance would make this chapter of much greater value.

The final chapter on treatment is probably the best in the book. It shows signs, especially in the admirable description of the salt-free diet, of knowledge gained from much first hand experience. The directions are simple, difficulties and dangers are pointed out and the results which may be hoped for are plainly indicated. Fluid restriction, salt restriction, high protein dietary, diuretics, purgatives and sudorifics and cardiac tonics are all weighed and their usefulness indicated, most importance being attached to salt restriction; mechanical means for removing fluids receive a short description, including skin incision and Southey's tubes, and their value is emphasized.

There is no sense of translation in the book; the ease and clearness of the original French are maintained and contact is never lost with the author. Altogether it is an admirable little book.

PROGRESS IN EYE, EAR, NOSE AND THROAT INVESTIGATIONS.

THE volume of the "Practical Medicine Series" for 1930 dealing with the eye, ear, nose and throat, is under the editorship of an eminent American professor in each department.[1] In addition to being an epitome of the literature of the year, this compilation has an enhanced value in the comments the editors make on many of the summaries. For example, in dealing with diathermy, Professor Shambaugh remarks: "The term diathermy is relatively new, and anything new invites a halo which use and experience usually largely dispel."

Throughout, Professor Shambaugh takes every opportunity to condemn incomplete removal of tonsils. In dealing with an article on tonsillar ignipuncture, he remarks: "We suspect that much which the laryngologist has learned from the harmful effects of ignipuncture may be found to be applicable to some of the more recent treatment of tonsils in place of their surgical removal."

Although an American compilation, the extracts are taken from the journals of many countries. Some five or six extracts are made from THE MEDICAL JOURNAL OF AUSTRALIA. Professor Small makes some interesting remarks on Susman's case of migraine reported last November. This volume is certainly as interesting and useful as any of its predecessors.

THE SKELETON.

DR. ROBERT BROOM, the author of "The Origin of the Human Skeleton," is to be congratulated on the production of a brief yet comprehensive account of comparative osteology, with its special bearing on the origin of the human skeleton.[2] Probably no one is more qualified to write such a work than the learned author, who has spent over thirty years in South Africa working on the fossil mammal-like reptiles found there and trying to solve the question of the origin of mammals. This same work has also enabled him to throw much light on the problem of the origin of lizards and crocodiles and also on the origin of dinosaurs and birds. Although the author has from time to time contributed to the various scientific journals many papers on the result of work, and is even now engaged in writing a monograph which will give in a more complete form the results of his thirty years' work, yet such a small book as the present will be very useful and acceptable to students of anatomy to enable them to appreciate more fully how the various bones of the human skeleton have arisen and to clothe them with an aura of scientific interest based on their phylogeny. The problems connected with homologies are always very difficult ones, and here, as elsewhere, the author probably puts forward views which are likely to be the subject of controversy, but as his views are based on such extensive work, they must be treated with respect. These views do not in any way detract from the value of the book as a useful source of information to students of anatomy.

The book is well illustrated with very clear and simple outline drawings and, in addition, two valuable diagrams are provided which greatly help the reader to follow the text. These illustrations show the evolution of amphibians, reptiles, birds and mammals and the evolution of man and the apes from the beginning of the Eocene period. A short bibliography of the more important recent works dealing with the evolution and morphology of the vertebrates is also given for those who wish to go more deeply into the subject.

ANATOMY OF THE RABBIT.

IT is generally realized in the Northern Hemisphere that the raw student approaching the subject of medicine should make his first efforts in the way of dissection on some comparatively inexpensive animal. Moreover, it is now very definitely accepted that the introduction to animal biology furnished by the first year medical course in zoology is more essential than ever. This striking increase in the standing of the zoology course for medical students has been partly occasioned by the general need for introducing students totally ignorant of biological science to the fundamentals of their subject, but still more owing to the part now played by zoology in investigating disease parasites and in the study of heredity. There has, of course, been a wholesale modernization of zoology courses for medical students and the post-war lectures in these subjects are as refreshing as some of the courses of years ago were dull.

Many of the old animal types still hold their own as subjects for practical study and amongst these the frog and the rabbit are used almost everywhere. These two creatures have certainly "done their bit" in the development of the biological sciences. Even the practising medical specialist turns to the rabbit at times in order to carry out some experiment or to gain some new facility. Practical text books on the frog are numerous and there are several on the rabbit, but there is certainly room for the new book which bears the title "Principles of Functional Anatomy of the Rabbit."[1] It is a complete guide to the dissection and anatomy of the familiar rodent, but it differs from many others in being well illustrated, distinctly easy to follow, and anything but a dry catalogue of structures. References to comparable anatomical features in man and references to the function of the parts described are good features of the book.

It is a pity that more has not been made of these aspects, for if the histological section had been left out, no increase in size would have been necessary. This section is brief and introductory, but is without illustrations, and it is doubtful whether it was worth inserting. A serious omission is the lack of reference to the sympathetic nervous system in the index and there is little more in the text. Some explanation of sesamoid bones might have been given, and, as noted above, many functional points might easily have been stressed, such as the relation of the jaw suspension to the type of feeding.

On the whole, however, the book can be very well recommended to those who for any purpose require a clear guide to the anatomy and dissection of the rabbit.

[1] "Practical Medicine Series: The Eye, Ear, Nose and Throat"; Series 1930. Chicago: The Year Book Publishers. Crown 8vo., pp. 568. Price: $2.50 net.

[2] "The Origin of the Human Skeleton, an Introduction to Human Osteology," by R. Broom, D.Sc., F.R.S.; 1930. London: H. F. and G. Witherby. Demy 8vo., pp. 164, with illustrations. Price: 10s. 6d. net.

[1] "Principles of Functional Anatomy of the Rabbit," by E. D. Crabb, Ph.D.; 1931. Philadelphia: P. Blakiston's Son and Company. Demy 8vo., pp. 144, with illustrations. Price: $1.50 net.

The Medical Journal of Australia

SATURDAY, MAY 30, 1931.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

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POLIOMYELITIS.

AT the meeting of the Federal Committee of the British Medical Association in Australia, held at Melbourne in March of this year, consideration was given to a proposal from the Victorian Branch that a request should be made to the Commonwealth Government for an annual grant towards the curative treatment of patients suffering from the effects of poliomyelitis. After discussion it was decided that Dr. A. W. Shugg, of the Tasmanian Branch, should act as a special subcommittee and that he should report to the Chairman. Dr. Shugg has submitted his report. His "statement of case" is published in another place in this issue. There also appears a short account of a conference convened by the Commonwealth Department of Health and held at Canberra on April 21 and 22, 1931, together with the resolutions adopted by the conference. The recommendations of the conference are the outcome of papers and discussion by authorities from the several States.

The first and most obvious point is the immensity of the subject. Dr. Shugg points out that 347 persons who have suffered from poliomyelitis, are drawing pensions amounting to £18,000 *per annum*. While it is not possible to quote statistics covering a number of recent years, it is interesting to note that in 1929 436 poliomyelitic infections were reported in the several States and that 240 of these occurred in New South Wales. Dr. Shugg states that 800 cases have occurred since 1925 in Victoria alone and that since December, 1929, 140 infections have been reported in Tasmania. From consideration of these figures some idea may be found of the financial burden of pensions on the Commonwealth Treasury in the years to come. Dr. Shugg gives an analysis of the results of treatment of 66 patients in Tasmania. He shows that the treatment has resulted or will result in an ultimate saving to the Commonwealth of £34,000. Had he wished, he could have pointed out that the persons who recovered, have been returned to the community as self-supporting units, capable of rendering service to the State. We might go further and stress the fact that, had every one of the 66 patients received early treatment—what might almost be called preventive treatment—little curative or corrective treatment would have been required, less disability would have resulted and even the three patients, so designated, would not have been "potential invalid pensioners." For this reason the utmost importance must be attached to the recommendation of the conference that the Commonwealth Government should subsidize the States to assist in the campaign against poliomyelitis, especially with reference to the preparation and testing of serum. Prevention is always better than cure. Prevention is possible only when the means for prevention are available. A great deal has been done in the provision of serum for purposes of treatment. The difficulties of collection and preparation are known as well as the dramatic results following use. The work of Dr. Jean Macnamara, Dr. F. M. Burnet and others, published in this journal from time to time, has shown that progress is attained only after much investigation and painstaking effort. Since so little is known about the virus of poliomyelitis and its mode of action, we cannot fail to wonder at the results following the use of serum from convalescent patients. Further research will bring still better results. Even if the virus be not isolated or the

mode of its action accurately determined, improvement will certainly follow further work on the preparation and storage of serum. The objective should be the serum treatment of every patient with poliomyelitis as soon as a diagnosis is made. There is thus every reason to urge the continuance of the work at the Walter and Eliza Hall Institute as recommended by the conference.

It is to be noted that as far as money is concerned, the Commonwealth Government is not being asked to shoulder the whole burden. It is asked to subsidize the States to "assist the campaign." There would be no ground for complaint if the Commonwealth Government were asked to undertake the whole matter. There are voluntary organizations in several of the States which are doing splendid work both in the early and late treatment of sufferers. The only possible reason for refusal to comply with the request would be the question of money. The enormous saving to the public purse that must follow on compliance, disposes at once of this bogy. The fact that the Commonwealth Government called a conference at Canberra shows that the Government is sympathetic. As faith without works is dead, so is sympathy without action.

Current Comment.

AIMS AND LIMITATIONS OF SURGERY.

LORD MOYNIHAN is reported to have said recently that surgery as a craft had reached finality. This is an extraordinary statement, especially from such an undoubtedly eminent surgeon as Lord Moynihan, a surgeon, be it noted, who has made his mark in his profession and who has had a hand in its progress. Still, it is a statement which has been made by someone of importance in perhaps every generation for many past years. It is only necessary to note the frequent improvements in surgical technique to realize that the statement cannot be accepted. It is not long since the brain was regarded almost as a sacred structure on which no man dared lay his hand. Operations on the brain are now not uncommon, but there is still much room for advancement in this branch of surgery; doubtless advancement will come. It is not unreasonable to anticipate equally great advances in surgical treatment of disease in other tissues such as the heart and great vessels, the lungs, the liver and the spleen. But surgery is something more than a craft; it is a science in which vast possibilities of learning remain. The aims and limitations of modern surgery were discussed by C. H. Fagge in his presidential address which he delivered before the Section of Surgery of the Royal Society of Medicine in November of last year.[1] "Who aims at sky far higher shoots than he who means a tree," quotes Fagge, and he is a happy surgeon, who, after many years of practice, still aims at the infinity of the heavens in his efforts to strike his ideal. The ideal of the philosophical surgeon is "restoration to the normal, both organism and tissue"; such ideal has never been attained. Efforts directed at the prolongation of the lives of people suffering from terminal states often result in a good deal of mutilation; such people are left in a condition which is by no means normal. There are few surgical procedures, says Fagge, in which one evil is not replaced by another, frequently unimportant though this other may be. Fagge admits that in the present state of knowledge mutilation cannot be avoided, but he remarks that this should not prevent the surgeon from "dreaming of more perfect surgical ideals." It might be added "nor of working towards their attainment."

Transplantation of organs belongs to a branch of surgery which is yet in its infancy. A grafted organ exercises its normal function for a period only; successful transplantation can be possible only when some means has been devised of providing for an immediate and adequate connexion of the transplanted organ to the recipient's blood circulatory system and lymphatic system. The necessity for the provision of proper lymphatic drainage is revealed by the œdema observed in some bulky skin grafts. Such a piece of skin may serve quite well the purpose of merely filling in a bare area, but it would scarcely be reasonable to expect a highly specialized organ to continue to carry out its complex function under similar abnormal conditions.

Though modern methods of aseptic surgery limit the formation of scar in a healing wound, the exercise of the most meticulous care cannot entirely prevent the development of fibrous tissue. Cicatricial tissue is unimportant in many situations, but in the highly specialized glands it must have an influence on function, and in the nervous system it forms a complete bar to the transmission of impulses. Fagge proceeds to discuss the effect of tension on the higher connective tissues. He believes that when such a tissue as muscle is subjected to abnormal strain by the dragging of sutures, either the sutures cut through or the muscle degenerates into scar tissue. In support of his view he instances the appearance of the conjoined tendon after Bassini's operation for the cure of inguinal hernia. In his experience this tissue becomes nothing more than a thin cicatricial layer. He remarks that most of the operations devised for the relief of ventral hernia result, not in the formation of a layer of normal muscular tissue protecting the opening, but in the replacement of a weak scar by a stronger one.

[1] *Proceedings of the Royal Society of Medicine*, December, 1930.

Fagge's short address is commended to the complacent surgeon in the hope that it might stir him out of his complacency; it is commended to the thoughtful surgeon, for it is worthy of his consideration, bearing as it does the suggestion of as yet unattainable ideals at which to aim.

Fagge's views on the question of scar formation no doubt are in the main correct, but the degeneration of muscular tissue into scar tissue is an indirect rather than a direct result of tension. Strain of any degree greater than that normally imposed on muscle does not necessarily cause degeneration of the muscle. If, however, the strain is so great as to cause interference with the blood supply, degeneration ensues. Perhaps this view is open to controversy, but it appears to be the most logical in the present state of knowledge.

Cutting operations must inevitably lead to scar formation. This is Nature's method of healing, and it is impossible to conceive how it may be improved upon. The best the surgeon can do is to assist natural healing by causing a minimum of injury, by proper attention to hæmostasis, and by the careful apposition of the sides of the wound he makes.

As for the future of surgery as a craft, it is safe to assert that many and great advances are ahead. Surgical treatment cannot remain at a standstill while sincere men are working at it, ever seeking more efficient and more humane methods; it cannot retrogress until its place is taken by some other form of treatment. It must be remembered, however, that the craft cannot be divorced from science; the one is dependent upon the other, and no true progress in the craft is made, but learning points the way.

TRICHINIASIS.

THE vegetarian has an argument at least worthy of consideration when he mentions the numerous diseases which may be contracted by eating flesh of one kind or another. If the pig were an adherent of vegetarianism he would not earn—albeit posthumously—the meat inspector's opprobrium for his measly pork; if man were no flesh eater he would not, by ingesting measly pork, invite attack by the *Trichinella spiralis*. It is thought that the pig often becomes infested by consuming infested rats, but if the pig took his rat "well done" instead of raw, he would not become infested, and, incidentally, he would be doing a service to that section of mankind which insists on eating its fresh pork or ham in a semi-cooked condition. Eaters of flesh are not necessarily prone to disease, but eaters of raw flesh assuredly are looking for trouble.

Infestation by *Trichinella spiralis* is not an uncommon condition in some parts of the world. The encysted larvæ are swallowed; they reach the adult stage in the small intestine; the gravid females burrow into the mucous lining of the intestine and give birth to embryos which find their way into the lymphatics, thence to the blood stream, to be distributed by the assistance of thigmotropism in skeletal muscles, where they grow and become encysted. The presence of the adult worm in the intestine is often associated with diarrhœa which may be choleraic in character; there is sometimes profuse hæmorrhage from the bowel. The passage of the embryos to the muscles and their establishment there are attended usually with symptoms of severe illness, often simulating typhoid fever, from which it is differentiated by the leucocytosis and eosinophilia produced by the toxin of the worms. The disease is sometimes fatal. It is said that the encysted larvæ may remain alive for as long a period as twenty-four years.

In a recent report Fred C. Aldridge describes an outbreak of trichiniasis which occurred in Pennsylvania.[1] He gives a brief but very good description of the symptoms *et cetera* of the disease, then proceeds to discuss the public health measures necessary for its prevention. Many of these are obvious, but he mentions the interesting fact that exposure to a temperature of −15° C. (5° F.) for twenty days will kill the parasite in meat. This temperature is, of course, considerably lower than the ordinary refrigerator temperature in which the worm can continue to live. Twenty-seven of Aldridge's twenty-nine patients ate pork obtained from a farm where, it was said, fifteen pigs had died of pneumonia during the previous three or four months. In all probability the pneumonia was of secondary importance and the pigs died of trichiniasis. Aldridge does not specifically mention whether the infestation in each instance followed the ingestion of fresh pork, but this appears to be the reasonable assumption. Only five of the twenty-nine patients suffered from severe symptoms, three had no symptoms at all. An interesting feature was the infrequency of gastro-intestinal symptoms; these were present in only six instances, in four of which they were slight. The percentage of eosinophile cells in the blood was usually very high; in one instance it was 86. Practically all the patients were foreigners. In two instances the disease caused death and in five others the illness was very severe. Aldridge stresses the necessity of examining other members of a household one member of which is known to be suffering from trichiniasis. In several children in the series the disease was very mild.

Though Manson-Bahr mentions that several cases of trichiniasis have been reported from Australia, we know of no authentic case of indigenous infestation. Rats have never been found infested in Australia. This is remarkable, for it seems hardly credible that no infested pigs, rats or dogs have ever been introduced. Australians are not likely themselves to become infested, as they are in the habit of eating their meat properly cooked, but the same cannot be said of Australia's rats, dogs and pigs, nor the whole of Australia's foreign population.

[1] *The American Journal of the Medical Sciences*, March, 1931.

Abstracts from Current Medical Literature.

OPHTHALMOLOGY.

Operation in Hereditary Optic Atrophy.

H. S. KUHN (*Archives of Ophthalmology*, March, 1931) reports a case of Leber's disease in which he was induced to make an exploratory exposure of the chiasmal region. Cushing, in 1912, did a decompression in a similar case and found an œdematous brain with an excess of fluid. No improvement followed. The author's patient was a man of twenty-five years, whose vision began to fail four weeks before. There was a family history of optic atrophy. A right frontal osteoplastic flap was made and the dura exposed. It was not under tension. The cortex and vessels were normal, also the pia and arachnoid, and there was no excess of fluid. There was no abnormal pressure in the lateral ventricle, as shown by the insertion of a cannula. When the chiasma was exposed, the parts appeared quite normal, including the pituitary gland. There was little change in vision after the operation.

Pathology of Retinitis Pigmentosa.

F. H. VERHOEFF (*Archives of Ophthalmology*, March, 1931) had the good fortune to examine the eye of a living person suffering from *retinitis pigmentosa*. The retina was greatly altered. No rods remained anywhere, but between the disc and macula were a few cones, much thickened and hexagonal in cross section. The neuro-epithelial layer had in fact been replaced by neuroglia. The nuclei of the internal nuclear layer were well preserved and the ganglion cells were decreased in number, but not markedly. The nerve fibre layer was of normal thickness. The pigment epithelium was everywhere altered. Some places were entirely free from pigment and in other places the cells were densely packed with pigment. In some places the pigment consisted of small round granules, and in other places it was in the form of round balls as large as a cell. The central retinal vessels and their main branches in the disc showed no thickening of their walls and were not obviously reduced in calibre. As they removed from the disc, their adventitia became increased in amount, and in front of the equator some were converted into solid strands of hyaline connective tissue. The optic disc showed a delicate neurogliar membrane extending over its surface; otherwise in sections the disc and nerve stem appeared normal. The chorioid, including the membrane of Bruch and the choriocapillaris, was normal except that some arteries showed endarteritis that would be expected at the age of sixty-four years. Leber concludes a critical analysis of the condition by saying that the essential retinal lesion was degeneration of the neuro-epithelium, the rods being the first affected, resulting in degeneration, proliferation and migration of pigment cells into the retina, overgrowth of neuroglia, and atrophy of the ganglion cells and optic nerve. The author's case confirms these conclusions except in regard to the ganglion cells and optic nerve. It is obvious that obliteration of the choriocapillaris can be dismissed as a possible cause of *retinitis pigmentosa*. The retinal changes cannot be due to the vascular changes, because still greater obstruction of the retinal circulation, even complete obstruction of the central artery, does not produce neuro-epithelial degeneration. In fact, it is the other way about. Collins has advanced the view that the degeneration is due to "abiotrophy," a theory that seems to explain all the facts, but, if true, excludes any hope of therapy being effective. A toxic influence may explain the facts equally well and the liver has been investigated by certain workers as a possible source thereof. There seems to be a connexion between hypertrophic cirrhosis and night blindness.

Chronic Cisternal Arachnoiditis.

G. J. HEUER AND D. T. VAIL, JUNIOR (*Archives of Ophthalmology*, March, 1931), report operations upon four patients suffering from blindness due to optic atrophy, the result of arachnoiditis. Case I was that of a white man, aged twenty-five, with blindness due to optic atrophy. He had constriction of visual fields, especially the temporal; no evidence of hypophyseal dysfunction was present. There was a history of severe cranial injury seven years previously. He had headaches and occasionally ringing in the ears. A diagnosis of chronic serous meningitis or chronic arachnoiditis was made. A large fronto-temporo-parietal bone flap was reflected on the right side and a dural flap reflected posteriorly. The pia-arachnoid over the exposed brain was much thickened and greyish white. Beneath it was a large amount of cerebro-spinal fluid, which escaped in quantities when the tough pia-arachnoid was torn with a needle. The base of the frontal lobe was elevated until the optic chiasma and nerves came into view. There was found a mass of adhesions about the anterior part of the chiasma and around the optic nerves. The *cisterna chiasmatis* was distended with fluid and its walls were thickened and opaque. The cistern was broken into between the *tuberculum sellæ* and the chiasma, and a large amount of fluid escaped. As much of the wall of the cistern as possible was snipped away with scissors and the adhesions around the optic nerves were separated so as to free them as much as possible. There was no tumour present. The patient recovered his vision and can read fine print. He has been under observation for three years. The second patient was a nurse with optic atrophy and bad sight. The *sella turcica* was normal. The same operation was performed, a similar condition was revealed and operation was followed by restoration of sight. The third patient, a woman aged forty-five years, complained of total blindness. She had headaches and vomiting and dizziness and optic atrophy. Operation was followed by excellent sight. The fourth patient was a coloured girl of fourteen years, with convulsions, impaired vision and pain in the abdomen. The condition came on in two weeks. She was fat and apathetic, but mentally clear. Her discs were white. She was operated upon and one and a half months afterwards was much improved mentally and could read fine print. The frequency of this condition is not known, but the author's experience suggests that surgical measures should be considered more seriously in cases of primary optic atrophy that are not due to tumour or other obvious causes.

Treatment of Spastic Entropion.

W. L. HUGHES (*American Journal of Ophthalmology*, January, 1931) describes a simple method of treating the spastic entropion of the lower lid. The skin about the external canthus is painted with iodine and 0·3 cubic centimetre of a 4% solution of "Novocain" is injected into the orbicularis near the margin. The needle being left in place, the syringe is replaced with one containing about the same amount of absolute alcohol, which is then injected. The good results are apparent after a few hours. If necessary, the treatment can be repeated in a few days.

Bee Sting of the Cornea.

C. A. YOUNG (*American Journal of Ophthalmology*, March, 1931) relates the case of a bee sting of the cornea, with observations on the anatomy of the sting and the chemistry of the poison. The patient, a woman of twenty years, had been suffering such constant pain and irritation of the left eye following a sting of a bee fourteen months previously, that she asked for enucleation of the eye. The biomicroscope showed two linear golden-brown structures lying obliquely in the *substantia propria*. The tip of one was in Decemet's membrane and of the other in the anterior chamber. At the first operation the author succeeded in removing half of one sting; then the anterior chamber was emptied. The second operation was futile. At the third the other half of one sting was recovered. Finally, the operator introduced a keratome behind the bee sting and the lens thus being protected, he with little difficulty removed the second sting. The anterior chamber did not reform for five days.

Ocular Tendon Transplantations.

R. O'CONNOR (*Archives of Ophthalmology*, February, 1931) outlines three methods of transplantation of tendons for securing outward rotation of the globe in paresis of the external rectus. In the first he transplants the inner three-fourths of both vertical tendons

under the uncut outer fourth and sutures them to the corresponding margins of the outer rectus. In the second he transplanted the whole of both vertical recti, but has abandoned the method as being too much of the nature of "burning the bridges behind." In the third method the inner half of the vertical tendons are cut free, they are applied over the outer halves and these are sutured.

OTO-RHINO-LARYNGOLOGY.

The Swim-Bladder and Weberian Ossicles in Fishes.

MUIR EVANS (*The Journal of Laryngology and Otology*, November, 1930) in an article on hearing in fishes concludes that in the *Cyprinidæ* the two-lobed swim-bladder has been shown to possess two functions. The posterior sac is hydrostatic, the anterior sac a receptor for vibrations. The anterior sac has been shown by Sorensen to vibrate and the tripus to vibrate with it. The *sinus impar* records vibrations which can only reach the sacculi. The series of ossicles are kept tense by a special muscle, the *tensor tripodis*. The external coat of the anterior sac has a structure similar to that of a vibrating membrane. The tip of the tripus is inserted in the middle of a free margin of the external coat, which is formed by a longitudinal hiatus in its superior wall. The posterior sac can be replenished by swallowed air. The pressure in the two sacs is controlled by the vagus acting in connexion with a specialized ganglion in the *ductus communicans*; this latter acts as a Eustachian tube. The author is also of the opinion that in the face of this cumulative evidence of an auditory function for the Weberian ossicles, we are compelled to go back to the views of Weber and acknowledge that he had a sounder physiological vision than some of his more enlightened successors.

Zinc Ionization of the Ethmoids.

JOHN MCCOY (*The Laryngoscope*, September, 1930) briefly reviews what takes place when zinc ionization is practised. In describing its application to the nose, he states that the nose is cleansed with warm saline solution, a 4% solution of cocaine is then applied to the part to be treated for a period of five or ten minutes, usually with a pledget of cotton. After the pledget of cotton has been removed, the cavity to be treated is filled with a 2% zinc sulphate solution or cotton wet with 2% zinc sulphate is applied to the part to be treated. The zinc electrode attached to the positive pole is placed in the nose so that the zinc electrode and the zinc sulphate solution are in contact. The patient holds the other pole in the hand. The current is then turned on very gradually until a strength of four to eight milliampères is reached. After continuing for ten minutes the current is gradually turned off. The author describes his treatment by zinc ionization of three patients who were thereby cured of sinus suppuration which had persisted after appropriate surgical treatment.

Recurrent Laryngeal Paralysis.

J. S. FRASER (*The Journal of Laryngology and Otology*, October, 1930) records the histories of three patients who recovered from complete recurrent laryngeal nerve paralysis. Two of the patients suffered from paralysis of the left vocal cord and both completely recovered after receiving treatment for syphilis. The third patient had involvement of the right vocal cord and nothing could be found on physical examination to account for it. This condition cleared up under treatment by vocal rest and increasing doses of strychnine. The author is of the opinion that these paralyses were probably caused by peripheral neuritis due in the first two instances to syphilitic virus and in the last probably to cold.

The Middle Ear and Its Vascular Anatomy.

WILLIAM J. GARDNER (*The Pennsylvania Medical Journal*, September, 1930) describes the findings on examination of the ears of patients operated upon for trigeminal neuralgia. Tympanic hæmorrhage was found to have occurred in thirteen of a selected series of 160 cases. The lesions consisted of an ecchymosis of the drum or of free blood in the tympanic cavity. The author is of the opinion that the vessel probably responsible for the ecchymosis of the drum is either the terminal twig of the stylomastoid artery as it emerges from the *hiatus Fallopii*, or the tympanic tributary to the middle meningeal vein, and that the presence of free blood in the tympanic cavity is perhaps due to the rupture of a membranous *tegmen tympani* at the time of operation. No treatment is necessary, as the blood is spontaneously absorbed.

Treatment of Ethmoiditis.

J. IVIMEY DOWLING (*The Laryngoscope*, September, 1930) describes the Dowling method of treatment of ethmosphenoiditis which may be resorted to, not alone for the relief of symptoms and to establish cure, but may also be used as a preoperative procedure. He holds that by this means surgical operation that is necessary, is safer and more satisfactory. The tampons to be used are made from sterilized long fibre cotton wound about a long, thin, wire-like applicator. After the tampons have been moistened to saturation by immersion in a 10% solution of argyrol, one is introduced into each nostril as far back as possible between the middle turbinated body and the septum. The applicators are then withdrawn and the tampons are left in position from ten minutes to an hour. After removal of the tampons the nares are thoroughly flushed to cleanse them of all secretions. This method of treatment is particularly useful for ethmoiditis in children persisting after the removal of tonsils and adenoids, and is also of material benefit to the asthmatic.

Adenoidism in Italy.

GUIDO GUIDA (*Proceedings of the Royal Society of Medicine*, September, 1930) discusses the incidence of adenoidism in Italy. Owing to the high percentage of auricular complications in patients suffering from adenoids and the important influence of these conditions upon the physical and mental development of the affected children, the Italian Government has issued instructions to provincial authorities to organize special institutions (*instituti contro l'adenoidismo*) which are to work in cooperation with already existing hospitals and clinics, and in which children suffering from adenoids will be examined and treated by operation by specialists.

Granuloma of the Larynx.

E. WATSON WILLIAMS (*Proceedings of the Royal Society of Medicine*, September, 1930) is of the opinion that trauma inflicted by mustard gas or other irritant gas may produce a granuloma. A typical clinical history appears to be one of exposure to gas followed by hoarseness after the subsidence of acute symptoms; after some years symptoms of laryngeal obstruction finally develop, cough and sputum are inconspicuous and the general health may remain robust. On examination a semi-pedunculated, slightly crenated reddish tumescence is found, most often springing from the subglottic region, just below the anterior commissure. When removed, it is found to be composed entirely of granulation tissue with squamous epithelium covering. Clinical and laboratory evidence of syphilis and of tuberculosis is negative. The histories of a number of patients suffering from this condition are given.

The Pathogeny of Aural Cholesteatoma.

DAN MCKENZIE (*The Journal of Laryngology and Otology*, March, 1931), in a paper on aural cholesteatoma, discusses at length the theories that have been brought forward to explain cholesteatomatous formation, and particularly the one which claims that cholesteatoma is due to invasion by the epidermis of the meatus. The two theories of metaplasia are mentioned, but the author does not find them conclusive. He gives a minute description of the structure of cholesteatoma and the manner in which it behaves in closed and open cavities. The changes which occur in and around a cholesteatoma are noted and mention is also made of the cerebrospinal cholesteatoma. The author has adopted the assumption that cholesteatoma is always primary, and concludes that the supposed origin of cholesteatoma from suppuration of the middle ear is an error based upon a misreading of the clinical and pathological data.

Special Articles on Diagnosis.

(Contributed by Request.)

XLVII.
PAIN IN THE BACK.

PAIN in the back is a symptom which may be due to such a number of causes that every patient with such a complaint must be put through a rigorous and comprehensive examination, both historical and clinical.

General Diseases.

All the acute fevers are heralded or accompanied by backache. The mode of production is unknown. All wasting diseases, for example, pulmonary tuberculosis, anæmia *et cetera*, are accompanied by backache, probably due to muscular lassitude consequent on the general reduction in vitality. In diabetes backache may be due to general weakness or to pancreatitis. General toxæmias, due to the absorption of poison from some focus of suppuration or decomposition, cause muscular lassitude and also perpetuate the effects of major or minor trauma in the musculo-skeletal system.

Diseases and Conditions Affecting a Particular System.

The Circulatory System.

Aneurysm of the aorta is the classical example of a disease of the circulatory system causing pain. There will, of course, be confirmatory findings, such as auscultatory murmur, other evidence of arterial disease, probably positive blood Wassermann reaction, and the typical lateral X ray appearance showing erosion of the vertebral bodies without destruction of the discs. Sclerosis of the arteries supplying the posterior root ganglia is stated to be a cause of backache. It cannot be of any great importance.

The Respiratory System.

Acute and chronic sinusitis may cause backache. In the acute cases the pain may be severe; it is situated in the lumbar region and is probably due to general toxæmia. Tonsillitis produces a similar condition. More chronic infections act as a reservoir from which poison is absorbed to carry out its usual rôle of delaying recovery from trauma.

Pleurisy, pneumonia of all types, bronchiectasis, abscess *et cetera*, and, in addition, those very indolent patches of bronchiolitis or actual bronchopneumonia which are found so commonly in influenza, are all producers of pain in the back. Clinical examination, with confirmatory X ray examination, will establish the diagnosis.

The Nervous System.

Meningitis, acute, subacute and chronic, poliomyelitis, encephalitis, inflammation of the root ganglia, neoplasms of cord and meninges, compression or irritation of nerves by trauma, neoplasm or inflammation, must be eliminated by neurological examination, lumbar puncture, "Lipiodol" injection, X ray examination *et cetera*.

The Genito-Urinary System.

In the kidney, pyonephrosis, pyelitis, perinephritic abscess, hydronephrosis, stone and neoplasm; in the ureter, inflammation, stone and possibly stricture; in the bladder, inflammation, retention and stone; in the prostate, inflammation, neoplasm and stone must all be considered. In the female genitalia there are numerous other possibilities: In the ovary, inflammation and congestion, cysts and neoplasms; in the tubes, inflammation, ectopic gestation and its accidents; congestion of the broad ligaments; in the uterus, inflammation, pregnancy, parturition and abortion, subinvolution, displacements if accompanied by congestion or inflammation, neoplasms; cervicitis and cervical neoplasm; relaxed vaginal outlet and prolapse. It will be noticed that the conditions indicated as possible causes in the female genitalia are those associated with increased weight and dragging on the suspensory apparatus.

Undue mobility of the kidney, particularly on the right side, was formerly regarded as a potent factor in the production of backache, felt mainly in the costo-vertebral angle. Later observations have indicated that unless associated with hydronephrosis or Dietl's crises, movable kidney is in itself of no great importance. The symptoms formerly attributed to the condition are due to the coloptosis which precedes and indeed appears to produce the prolapse of the renal organ.

Consideration of the history and the results of general examination will direct attention to the genito-urinary system. Examination of the urine, cystoscopy, pyelography, vaginal and rectal examination and X ray examination may be required.

The Alimentary System.

In the mouth, dental sepsis is a fruitful source of toxin. The rampant edentulation of former years, however, is to be deplored. Stricture and neoplasm of the œsophagus may cause pain on deglutition, as may any inflammatory condition near by. Liver conditions, such as hepatitis, abscess, hydatid and neoplasm; cholecystitis and neoplasm of the gall bladder; biliary colic, pancreatitis, cysts and neoplasms of the pancreas; perisplenitis and infarct of the spleen; peritonitis; neoplasm, ulcer or inflammation of the stomach, duodenum or the remainder of the intestinal canal must be considered. "Indigestion," whether functional or organic, is particularly prone to cause the typical pain under the left shoulder blade. Constipation is one of the commonest causes of lumbar backache. It may be due to actual obstruction, as in neoplasm, or adhesions or pressure from without; it may be due to congenital coloptosis or to megacolon, or simply to atony and bad habits. Visceroptosis, congenital or acquired, is associated with colonic delay and an increase of the dragging weight of the intestinal contents. Hæmorrhoids, particularly if inflamed, may give rise to quite severe backache.

I have made no attempt to enumerate all the possible extraneous causes of backache, but have endeavoured to indicate the lines upon which inquiry must proceed. Wherever the history and general examination show the possibility of one or more of these systemic causes being at work, the most important being those in the genito-urinary and alimentary apparatus, the most meticulous care must be taken to clear the ground before the blame is fixed upon what may be a perfectly innocent musculo-skeletal scapegoat. On the other hand, much useless work is done upon the abdominal and pelvic organs for conditions which really arise in the muscles, bones and joints of the spine.

The Skeletal and Muscular System.

Faulty posture is a common cause of backache. Even among adolescents and young adults a very large proportion is found to stand in the typical position of relaxation —feet turned out, knees and hips slightly flexed, buttocks prominent, lumbar lordosis exaggerated, dorsal region of the spine prominent, shoulders drooping forward. This is an attempt to stand rather by balance than by bracing, a muscular laziness due to excessive amount of standing which is imposed on the young. The wearing of unsuitable boots and shoes, the heels too high and the inner borders not straight, makes the condition worse, destroys the balance of the foot and reacts still further upon the spine. In addition, general muscular fatigue, heavy clothing suspended from the shoulders and bad alimentary and excrementary habits take their toll of what is at best but a clumsy adaptation of a pronograde to a plantigrade mechanism. The result is an increased pull upon the ligaments of the lower part of the spine, with a tendency towards strain at the junction of the mobile and the fixed portions at the lumbo-sacral region. Consequent upon the increased lumbar lordosis is a relaxation of the abdominal musculature, with a tendency towards visceroptosis, colonic stasis, and an increased drag on the back.

Obesity, the bugbear of woman, to a less degree of man, while it helps to support the intraabdominal organs, tends further to increase the lumbar lordosis, as the upper part of the trunk is thrown back to preserve the equilibrium. The increased drag upon the lumbar spine is obvious.

Muscular lassitude and atony, due to improper or insufficient feeding, anæmia, toxæmia or disease, will still further encourage the desire to stand rather by balance than by bracing.

Any more distant cause which upsets the delicate adjustment of the upright position will affect the musculoskeletal system, and its repercussion will be felt by the spine. Thus flat feet will cause a faulty posture, by which the feet will be still further strained. Any asymmetry of the lower limbs, such as long leg, knock knee *et cetera*, may, by throwing unequal strains on the spine, be the cause of backache.

Pregnancy and Parturition.

During pregnancy the increased weight of the uterus will demand compensatory lumbar lordosis in order to adjust the centre of gravity. The additional drag and the increased curve are responsible for backache. In the later stages of pregnancy there is a preparatory relaxation of the ligaments guarding the sacro-iliac joints. As a result of the actual parturition, particularly if in Walcher's position, there may be an actual subluxation of the joint. More frequently, however, there is a delay in the subsequent tightening of the ligaments with the production of a loose and vulnerable joint. This complication is particularly liable to occur in the presence of subinvolution or other infective sequelæ.

The stretched abdominal muscles are too often supported by binders and corsets instead of being encouraged to recover their normal length, strength and elasticity. The result is the sagging abdomen, with increased strain upon the lumbar region of the spine. As the result of damage at parturition to the suspensory apparatus and the perineum there may be displacements or prolapse of the uterus, accompanied by congestion and consequent backache.

Vulnerable Points.

In the spinal mechanism itself there are the vulnerable points of muscle and tendon, bone and cartilage, joints and ligaments.

Muscle and tendon are subject to trauma, paralysis and inflammation. In bone there are developmental abnormalities, such as wedged vertebræ, *spina bifida*, sacralization and lumbalization, failure of union between bodies, pedicles, laminæ and articular processes, chordoma and sacro-coccygeal tumours. It may be affected by trauma, osteomyelitis, pyogenic, tuberculous and syphilitic, and by neoplasm, either primary or secondary. Cartilage may suffer from trauma, inflammation and calcification.

Joints and ligaments are particularly prone to injury and to inflammation, which may be actually infective, or due to the engrafting of a toxic factor upon a previously injured or irritated structure.

In addition, mention must be made of certain bursæ, particularly the gluteal bursa, inflammation of which has been known to cause severe backache.

The Clinical Examination.

Points of particular importance in the investigation of the condition of such patients as have passed through the barrage of a careful general examination are:

1. A family history of "rheumatism." In many families there is a notable tendency towards an "aching back," frequently due to familial type, faulty posture and colonic stasis.

2. A previous history of fleeting pains in various joints, old injury, poliomyelitis, asthenia in adolescence, constipation, sepsis in nose, throat, teeth, genitalia *et cetera*.

3. A present history of trauma or absence of definite trauma, the mode of onset of the pain, its location, nature and severity, whether continuous or intermittent, whether getting worse or better.

4. Symptoms: The general health and well-being; type and location of pain and tendency to radiation; stiffness; the effect upon pain and stiffness of rest, work and movement and of bodily functions, such as digestion, evacuation, menstruation *et cetera*.

5. Signs: All the clothes should be removed, or in the female patients the bloomers may be retained, but lowered to the level of the trochanters.

Inspection.

Note the body type and the general posture, both front, back and profile. In the back note symmetry or asymmetry, curves both antero-posterior and lateral; list; swelling; wasting; spasm; level of posterior superior iliac spines.

In thighs and legs note any asymmetry, inequality in length and girth, or deformity, such as knock knee. Examine the feet, particularly as regards weak position, deviation of the *tendo Achillis*, or actual flatness.

In the movements (active), or while the patient is standing still, note any pain. In flexion and recovery, extension and hyperextension, lateral bending, rotation, mixed movements, note the degree of movement, the point of limitation and whether the movement is limited by pain or stiffness and where this is felt.

While the patient is sitting with the knees and hips flexed, normally the abdomen and lower part of the chest should touch the thighs. Any limitation indicates a lesion above the sacro-iliac level.

While the patient is lying, raise both legs separately and together. In many lower spine lesions the legs cannot be raised together, the necessary bracing of the spine causing pain. The possibility of straightening the lumbar spine, actually ironing out the lumbar lordosis, should be tested both when the patient is standing and lying.

In passive movements, with the patient standing and sitting and with forced flexion, note any increase of pain.

With the patient lying, test hip and knee joint movements, and in the prone position test hyperextension of the spine. This is limited early in tuberculosis of the spine and is painful in strains of the anterior ligaments and of the interarticular joints. In the supine position carry out straight leg raising; note any limitation, at what angle and where pain is felt. This test is useful in sacro-iliac conditions, limitation being caused by pain over the affected joint and sometimes in the course of the sciatic nerve. The limitation is more pronounced on the affected side, but raising the opposite leg causes pain over the affected joint owing to tilting of the pelvis. The test indicates the sacro-iliac joint only if limitation is marked; all lower spine lesions cause some limitation at a high angle of elevation.

Palpation.

Points of tenderness may be found over the spinous processes or the interspinous ligaments, indicating a bruising or local injury. Tender points and "knots" over muscle or aponeurosis indicate a musculo-tendinous injury and tenderness over the crest of the ilium is often due to a similar cause. Tenderness over the lateral and articular processes means injury or inflammation of the interarticular joints and the ligaments appertaining thereto. At the lumbo-sacral junction, tenderness in the mid-line indicates a lumbo-sacral strain; tenderness over the ilio-lumbar ligament may mean a strain of the ligament or a lesion of the lateral lumbo-sacral joint, or the transverse joint if it exists; tenderness over the posterior superior iliac spine and below it may indicate a sacro-iliac condition; over the sacro-coccygeal joint, some lesion of that joint. Tenderness over the course of the sciatic nerve is frequently found when there has been referred pain in that distribution for a considerable time.

Sensation.

Test for anæsthesia, hyperæsthesia and paræsthesia. After long continued sciatic pain, even when referred, there is frequently to be found some degree of paræsthesia.

Reflexes.

Knee jerk and ankle jerk should be tested and compared. Very few patients with so-called sciatica will show any demonstrable loss or diminution of ankle jerk. If there be such loss or notable diminution, it must direct attention towards some structural interference with the nerve. I believe that in all the cases of sciatica due to lesions of the lower part of the spine without gross bony deformity the pain is a referred pain due to the innervation of the affected joints by twigs from the trunks which take

part in the make-up of the sciatic nerve. Occasional cases of demonstrable pressure do occur, but generally in association with gross bony outgrowths. At the same time it must be recognized that many observers consider that the pain is due to pressure upon the nerve trunks at their emergence from the spinal foramina or in their course on the ventral aspect of the lower lumbar vertebræ and the sacrum. The argument must wait until another day.

Special Tests.

The Wassermann, Kahn, von Pirquet, the resorcin test, and the complement fixation test for gonococcal infection must be carried out.

X Ray Examination.

It has been stated (Osgood) that the most important single examination in these cases is the taking of good X ray films, both antero-posterior and lateral. Particular attention must be paid to contour and alignment; the vertebral bodies and cartilages; abnormalities, such as sacralization and lumbalization, *spina bifida occulta et cetera*; symmetry or asymmetry of the lateral intervertebral articulations; sclerosis and false cyst formation about the bony surfaces of the sacro-iliac joints; symmetry of the pelvis and, finally, the possible shadow of a stone or a calcified mesenteric gland.

Very many cases are immediately diagnozed by the examination of good films, but I have quite deliberately made it the last of the investigations. One is only too liable to scamp the rest of the examination and hurry on to the shadow show as a short cut to diagnosis. A nicely sacralized fifth lumbar may easily distract the attention from what should have been a perfectly obvious sacro-iliac arthritis, and if one has succeeded in making a diagnosis already, think of the joy of having the confirmation of the picture afterwards. The abnormally horizontal sacrum, sharp lumbo-sacral angle and vertical lumbar spine will confirm the diagnosis of faulty posture and strain of the anterior lumbo-sacral ligaments. An actual slip or spondylolisthesis will be perfectly shown. This condition can occur only if the articular facets are of the lumbar type or if there has been failure of fusion between the articular processes and the pedicles and laminæ. Sacro-iliac arthritis of long standing will show some degree of sclerosis of the bony surfaces and possibly some false cyst formation in the bone. Concussion arthritis of the sacro-iliac or transverse lumbo-sacral articulations will show sclerosis. (The transverse lumbo-sacral articulation is that between the sacrum and a large impinging transverse process). Sacro-coccygeal arthritis may show in the film, but a rectal examination will be a more certain diagnostic measure. The pelvic asymmetry largely quoted as a diagnostic sign in sacro-iliac conditions is probably postural; even in actual subluxation cases the amount of displacement is too small to demonstrate, being, as it is, a rotation rather than an actual longitudinal slip.

Tuberculosis of the vertebræ and cartilages is characterized by destruction; new growth has a typical foamy appearance; syphilis generally produces a considerable amount of bony overgrowth, which, however, may also appear in tuberculosis of long standing. In the sacro-iliac joint tuberculosis causes destruction with frequently a longitudinal slip.

Fracture is well shown in lateral films and the aftermath, Kümmel's disease, is readily discernible. Fractures of lateral processes and fractures of the sacrum show well in the antero-posterior films. Spinous processes are difficult to show well, but the diagnosis without X ray examination is not difficult.

Some degree of spondylitis is present in nearly every patient over forty years of age, a condition due to heavy work, faulty posture and probably some added toxæmia. It must be remembered that our anatomy was not designed for strenuous labour in the upright position. Too many of these patients, the victims of some minor trauma, are examined by X rays, labelled as suffering from spondylitis and relegated to the dustheap of chronic invalidism. They had the spondylitis before, the trauma has caused some injury, generally in the lateral articulations rather than in the pseudarthrosis between the bodies and the condition is perpetuated by weight-bearing and toxæmia. Occasionally a fracture in a bony bridge between the vertebral bodies may be demonstrated. These cases will repay careful investigation, localization of the lesion and treatment designed to support the injured articulation and to eliminate toxæmia.

Spondylose rhizomelique, the ankylozing arthritis of the spine which is comparatively common among young men, in its usual form commences in the sacro-iliac region. At first painful, as ankylosis ensues, the pain disappears. X ray examination reveals the obliteration of the joints and the gradual ossification of the spinal ligaments.

Trauma.

The minority of patients deny trauma and in these the disability is generally of gradual onset. Postural conditions and a possible toxic factor will require consideration, as will also actual bone infection (for example, tuberculosis) or neoplasm.

Where there has been severe, or at any rate definite, trauma, with the signs and symptoms dating from its occurrence, attention will be directed towards injury to muscle and tendon, bone or ligament.

A history of old trauma, suffered perhaps years ago, and its memory resuscitated simply to account for the present condition, may as a rule be disregarded.

The most troublesome and, unfortunately, the most numerous group consists of those who give a history of trauma, but whose signs and symptoms are not commensurate with the degree of injury sustained. In these cases the probability is that one of the joints of the spine has been injured—"sprained"—in fact; that by weight-bearing and lack of support the injury has been perpetuated and that an actual arthritis has developed. In some cases there has been too much protection, with the result that the injured tissues have healed "in a knot"; movement produces traction on the sensitive scar and pain is the result. Such a condition is seen as a result of injury to the musculo-tendinous junction or to ligaments. A joint may also be damaged by concussion, a condition seen in the sacro-iliac joint or in a transverse lumbo-sacral joint as a result of a heavy fall on the buttocks.

Toxæmia.

The presence of a toxic element will always delay healing. In very many of the patients who are incapacitated by what appears to be a minor trauma, the persistence of the condition is due to this factor. Dr. W. R. Boyd, who sees large numbers of incapacitated workers, believes that recovery is very much accelerated by attention to the teeth. The tonsils and the nasal sinuses are probably uncommon sources of the irritating toxin. The majority of commentators blame the large intestine. Osgood, Albee and others quote large numbers of cases completely relieved by colon lavage.

Abnormalities.

There has been a considerable amount of discussion as to whether the abnormalities so frequently seen by X rays in the lumbo-sacral region can be in themselves productive of backache or other disability. The consensus of opinion is that they cannot. But to my mind there can be no doubt that the presence of some of these conditions renders the spine more vulnerable to injury. Although abnormalities appear to be so frequently found by accident during X ray examination for other conditions, they are five times as frequent in patients complaining of backache. A unilateral partial sacralization, with the formation of an imperfect joint between the transverse process and the sacrum, is a point of vulnerability. The imperfect joint may be injured by concussion or an abnormal strain may be thrown upon the joints on the opposite side. Spondylolisthesis can take place only in the presence of some lumbo-sacral abnormality. Asymmetrical articular processes must lead to asymmetrical distribution of strain, with a consequent tendency towards localized injury.

Compendia Illustrative of Certain Conditions.

"Fibrositis."

"Fibrositis" is not so common as is ordinarily supposed. It is due to injury at the musculo-tendinous junction,

with healing "in a knot." There is a history of a serious muscular effort, with a sensation of something giving way in the back. There is often little disability at the time, but after resting there is severe pain in the back, rendered excruciating by resumption of exercise, but wearing off on continued movement. Active movements are limited by local pain, particularly on stretching the injured structure, or on contraction of the affected muscle. Thus pain is felt rather on recovery to the upright posture than on bending, although forced flexion, which causes stretching, will increase the pain. Definite points of tenderness are to be found and these correspond generally to the points of insertion or origin of the short spinal muscles. There is no radiation of the pain and X ray examination reveals no abnormality. Injection of the sensitive spots with alcohol will frequently cure the condition.

"Lumbago."

"Lumbago" is a very severe and disabling pain, coming on apparently as the result of some insignificant movement. For example: "I got out of bed, stooped down to pick up my socks and felt as if I had been stabbed in the back." There is frequently a history of exposure. The patient is often of an arthritic type, eating and drinking a little too well. There is a definite tendency to recurrence, particularly after exposure or dietetic indiscretions. In acute cases there is a great agony, inability to move in any direction, tenderness all over the lumbar region on one or both sides. The condition is an arthritis of one of the interarticular joints and usually gets well in a short time, although some cases go on to a chronic stage. X ray examination reveals no abnormality.

In the majority of cases there is no radiation of the pain unless the condition becomes chronic. Rest, aspirin, local heat and attention to elimination are necessary.

Sacro-Iliac Subluxation.

The patient who suffers from sacro-iliac subluxation is usually of the long-backed type and is seized with a sudden pain while carrying out a heavy lift with the legs braced. The trunk is usually being rotated, as in loading heavy articles into a van. The pain is felt over the posterior superior iliac spine and down the course of the sciatic and external popliteal nerves. Disability is immediate and complete. There is acute tenderness over the posterior superior iliac spine. Straight leg lifting is markedly limited on the affected side and limited to an almost equal degree on the unaffected side by pain which is felt in the injured joint. X ray examination reveals no abnormality, as the amount of slip is very slight and is rotatory. Many subluxations undergo spontaneous reduction as soon as relaxation is obtained; the remainder are easily reduced by manipulation.

Sacro-Iliac Sprain and Arthritis.

In sacro-iliac sprain and arthritis there is a history similar to that given in subluxation, with a sensation of something giving way in the region of the sacro-iliac joint. At the time there may be comparatively little disability, but there is gradually increasing pain in the affected region, pain felt particularly after rest, becoming less on warming up and reappearing on further activity. There is a list away from the lesion, standing flexion is limited by pain and hyperextension is often painful. Lateral bending away from the lesion is limited by pain. Sitting flexion is free. Straight leg lifting is limited on both sides by pain in the affected region. There is tenderness over the posterior superior iliac spine, over the sacro-sciatic ligament and in acute cases over the sacrum also. X ray examination reveals no abnormality. In cases of longer standing, where as the result of repeated trauma by weight-bearing, insufficient or too efficient support, and toxic absorption, arthritis has developed, there will be some additional evidence. Referred sciatic pain usually appears some two or three weeks after the accident. The distribution is to the back of the thigh and the outer side of the leg. There may be paræsthesia in the region of pain. Disuse wasting will appear and X ray examination may reveal sclerosis and false cyst formation. Iliac crest compression may cause pain in the affected joint, but a normal finding is of no value. Rectal examination reveals no abnormality.

Lumbo-Sacral Sprain and Arthritis.

Central Lumbo-Sacral Sprain and Arthritis. Central lumbo-sacral sprain and arthritis are commonly the result of postural errors. Without history of antecedent trauma there develops an aching pain in the lumbar or lumbo-sacral region. There may also be some aching round the hips, but no true radiation. Examination will reveal faulty posture, exaggerated lordosis and prominent abdomen. Movements are free in all directions, although hyperextension may cause some pain due to stretching of the irritated anterior lumbo-sacral ligament. There is frequently some tenderness over the lumbo-sacral joint in the mid-line posteriorly and occasionally through a lax abdomen the overstretched anterior ligament may be found to be tender. X ray examination will disclose the abnormally horizontal sacrum, sharp lumbo-sacral angle and vertical lumbar spine typical of the condition.

A traumatic sprain of the central articulation may result from forced hyperextension. Unless the posture is weak, the condition rapidly clears up. Hyperextension is the only movement limited.

Lateral Lumbo-Sacral Sprain and Arthritis. In lateral lumbo-sacral sprain and arthritis the articulation may be sprained by forced movements similar to those which produce sacro-iliac sprains, but in which the trunk has been more extended. Violent twisting movements of the trunk may also produce it. A concussion arthritis may be produced by forced hyperextension or by heavy falls on the buttocks. On inspection some spasm of the lower part of the *erector spinæ* may be seen and there is generally a list away from the lesion. Standing flexion is only slightly limited, but the recovery to an erect position is difficult. The patient feels that at some point there is a catch, which is due to the damaged facets gliding upon one another. With some wriggles and contortions he will worm his way past the catch and regain the upright position. Hyperextension is painful, as is lateral bending towards the lesion. Sitting movements are limited in the same way, providing a contrast to the findings in sacro-iliac conditions. Straight leg lifting is limited only at a high angle. The point of tenderness is very close to the posterior superior spine, but slightly above and to the inner side. There should be no tenderness over the sacro-sciatic ligament and iliac crest compression reveals no tenderness. Referred pain is common and may be in the course of the sciatic and external popliteal nerves or towards the front of the thigh. X ray examination reveals no abnormality.

Transverse Lumbo-Sacral Sprain and Arthritis. The transverse joint, if it is present, is damaged most frequently by concussion. Movements of hyperextension are limited. Tenderness may be found on deep pressure over the process. The referred pain is in the distribution of the sciatic nerve, but owing to abnormalities of the plexus associated with sacralization and lumbalization, it is useless to attempt to differentiate between the areas supplied by individual nerves. Nearly all the referred sciatic pains appear to select the external popliteal for their final distribution. X ray examination will demonstrate the abnormal joint and the sclerosis associated with the arthritis.

Spondylolisthesis.

In spondylolisthesis there may be a history of trauma, or the condition may develop gradually. In some long-standing cases the fifth lumbar vertebra may lie entirely anterior to the sacrum. In such cases the trunk viewed from behind appears shortened, and a hiatus may be felt above the sacrum. In conditions of lesser degree a depression is found above the sacrum and there may be some tenderness in this situation. The patients complain of aching at the lumbo-sacral junction and round the pelvis and sometimes of a feeling of instability in the back. Movements are free, but hyperextension may be painful. With the patient on all fours, the fifth lumbar vertebra may in some cases be pressed up into its correct relative position. X ray examination confirms the diagnosis. In my experience slips between the fourth and fifth lumbar vertebræ are as common as those between the fifth and the sacrum.

Sprains and joint injuries in the lateral spinal joints diminish in frequency as we leave the more vulnerable junction of the mobile and the fixed spine. In the dorsal region they are practically unknown, but in the upper lumbar region an occasional case is to be found. The particular joint affected may be fixed by careful examination. Muscle spasm, limitation of special movements and local tenderness are the important points in diagnosis. X ray examination reveals no abnormality.

Fractures present no particular difficulty in diagnosis. The backache which persists in many cases after satisfactory healing of the original injury is due to a traumatic arthritis of the lateral intervertebral joints. Where there has been alteration of alignment of the joint surfaces this arthritis may become chronic and very disabling. Any toxic factor will, of course, delay healing and fixation may be the only remedy.

Tuberculosis.

In general, the pain caused by tuberculosis is felt in the distribution of the nerves of the affected segment and actual backache is not a prominent symptom. In many cases of healed tuberculosis, however, there is persistent backache due to faulty alignment of the lateral joints. X ray examination will demonstrate the original condition, but not the traumatic arthritis.

New Growth.

Severe backache is caused by the common secondary deposits of new growth in the vertebræ. A search for the primary growth and X ray demonstration of the secondary deposits will clear the position.

Scoliosis.

In the postural type of scoliosis seen in adolescents, the backache is due to muscular inefficiency. The strain falls upon unyielding but sensitive ligaments which quickly voice their protest.

In the later stages, when structural deformity is present, pain over the posterior convexity of the ribs is a common complaint. It is due to stretching of the soft tissues. The diagnosis presents no difficulty in either type of case.

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British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on March 4, 1931, DR. VICTOR HURLEY, the President, in the chair.

Chronic Respiratory Infections in Childhood.

DR. GUY SPRINGTHORPE read a paper entitled: "Chronic Respiratory Infections in Childhood" (see page 649).

DR. JOHN DALE congratulated Dr. Springthorpe on his excellent and very interesting paper. He regretted that no intelligent lay people were present, as the investigation was of the greatest importance from a public health point of view. Had they been present, they would have seen and realized some of the problems confronting the medical profession.

Dr. Dale pointed out that the problem of these children could be tackled in two ways: (i) By the Government Medical Service appointing paid officers in hospitals. (ii) The community should bestir itself so as to enable all those who might be infected, to seek medical aid. He realized, however, that economic factors must be considered. Dr. Dale then mentioned that the discrepancy between the 20% of positive von Pirquet reactions in the American series and the 80% which had been found in some Continental countries, compared very closely with the death rate in those respective countries. He said that it would be very interesting in Australia to compare the number of tuberculous infections found in the large cities with those occurring in the country. He then went on to say that the support of the general practitioner was needed in order to educate the public that the tests for tuberculosis were quite harmless. He asked members their opinion of nasal drill, stating that he was impressed with the efficacy of this procedure. He then mentioned that the Public Health Department allowed a lay person to attend the recently established nursery school in Melbourne to instruct the pupils in this drill and he thought they benefited as the result.

DR. DOUGLAS GALBRAITH pointed out that in the winter months 30% of the children seen in the medical out-patient clinics of the Children's Hospital came under the category of chronic respiratory infections. It was of the utmost importance to prevent children from coming into contact with patients infected with pulmonary tuberculosis. Dr. Galbraith then discussed the ætiology of chronic non-tuberculous hilar infections. He stated that in his opinion the most common predisposing factors were pneumonia, measles and whooping cough. In reference to non-tuberculous chronic respiratory infections, the following further ætiological factors had to be considered: (i) Chronic upper respiratory infections, including pyorrhœa. (ii) The patient's own physical condition. (iii) The hygienic surroundings. (iv) Constitutional diathesis, such as tuberculosis or syphilis. (v) The type of infection. There were a number of cases which commenced as an acute interstitial pneumonia, in which the chronic interstitial type of disease finally developed. (vi) A foreign body in a bronchus. This condition was not often found in Melbourne. (vii) A small amount of pus in the pleural cavity. At times cases were seen in the out-patient department in which a diagnosis of chronic empyema had been made because needling demonstrated the presence of a little pus and yet subsequent paracenteses had been without result. The original small area of suppuration might act in two ways: (*a*) As a septic focus, (*b*) by "tacking down" a small area of lung by adhesions which might lead to a local stasis and the subsequent development of a bronchiectasis.

Chevalier Jackson, in a recent paper read in England, had said that whereas twenty years before 90% of his bronchoscopic examinations were for surgical conditions, now a similar percentage were for medical conditions.

DR. BELL FERGUSON stated that the workers at the Tuberculosis Bureau in Melbourne were very alive to the difficulties in diagnosis. He went on to say that Dr. Springthorpe did not make clear the abominable ill health and miserable feeling that antral infections caused.

Dr. Ferguson then said that skin tests were not of much help in the diagnosis of pulmonary tuberculosis. For years he had been using subcutaneous tuberculin tests which were not dangerous with experience and great care; then again they were quantitative to a certain extent. He then mentioned that he had tried to start open air schools and open air classes, and he thought that a clinic for chronic non-tuberculous cases would be of great value to the community. He thought that nasal drill was a useful procedure. Dr. Springthorpe stated that the temperature was usually normal. This might be so in clinics, but he (Dr. Ferguson) had an impression that if it were taken twice a day the temperature of a number of patients would be found raised in the morning. He stressed the importance of repeated antral X ray examination, pointing out that in a number of children these sinus infections cleared up without any operation being necessary. Dr. Ferguson wondered what benefit ionization would have. He then discussed X ray examination carried out to determine whether any hilar gland enlargement was present, and pointed out that a soft enough tube was at times not used when patients were examined in the early stages of infection.

DR. D. EMBELTON first discussed tuberculous pulmonary infections and mentioned that they were usually fatal in children under the age of three years. Over that age the condition was not necessarily fatal and, he thought, to a certain extent a mild infection was beneficial. He was not so sure that if children in early life were prevented from

all tuberculous contact and then later on should develop the infection, this latter would not be more serious than it would have been if they had acquired some degree of immunity. With regard to non-tuberculous chronic pulmonary infections, he thought that chronic bronchitis was one of the commonest predisposing conditions. He considered bronchiectasis to be quite rare and said that the condition might clear up spontaneously.

Dr. Embelton then said that Chevalier Jackson had stated that the most important cause of chronic pulmonary disease was insufficiency of the cough reflex and that he had instituted in some cases a sucking apparatus, thus obviating "drowned lung." Patients with bronchiectasis did not necessarily expectorate foul sputum. In his opinion the main causes of chronic lung conditions were infections of the upper respiratory tract, which not only predisposed the lung conditions, but at times produced general symptoms, and he cited one such patient who had developed a definite refractive error. He concluded by saying that every attempt should be made to increase the size of the nasal passages if there were any narrowing.

DR. F. KINGSLEY NORRIS said that it was very important to distinguish between tuberculous and non-tuberculous infections, as much time and money might be saved in treatment. In the course of practice very many chronic pulmonary infections were seen and he wondered what happened to many of the patients in later life. Dr. Norris discussed the clinical evidence of enlarged bronchial glands and said that most of the old signs were not of much importance. He thought, however, that D'Espine's sign was of help if carried out correctly. The patient should be examined in the sitting position and the sign was a continuation of the whispered echo below the level of the second dorsal vertebra; it was not simply the whispered sound itself.

Dr. Norris then referred to the ætiology of bronchiectasis; he thought that it was due to a slow breaking down of the bronchial wall itself as the result of some ulcerative process. In conclusion he said that pulmonary drill was of much greater value than nasal.

DR. H. DOUGLAS STEPHENS congratulated Dr. Springthorpe on the excellence of his paper and pointed out that the subject was a very wide one. He went on to say that Dr. Embelton had stressed the importance of nasal obstruction. He himself thought that this condition was frequently present at birth and he had seen purulent antra in infants under the age of twelve months, in some of whom the infecting agents were gonococci. At the present time syphilis was not an important factor in these conditions, but after the South African War he had regarded that infection as a frequent cause of antral diseases. He frequently saw children with cleft palates. In spite of the fact that there was no nasal obstruction, these children often developed infected antra. Children with cleft palates not infrequently had enlarged post-nasal growths, but he seldom removed them, as their presence helped the speech development.

Dr. Stephens then said that in Vienna the von Pirquet test was performed in all doubtful tuberculous conditions, and if no reaction occurred in eight days, then the test was repeated. He asked whether the subcutaneous tuberculin test were not dangerous when carried out in doubtful cases of pulmonary tuberculosis. In his opinion most of the chronic pulmonary infections in children were "caught" under the age of three years.

DR. JOHN O'SULLIVAN said that when in Vienna he had the impression that some infection of the bronchial glands was regarded as being almost universal. He mentioned that Gohn had pointed out that he was able to demonstrate this infection in 80% of cases. Dr. O'Sullivan then discussed interstitial pneumonia and said that it was very difficult at first to differentiate that condition from the early stages of miliary tuberculosis. He stressed the importance of using very soft X rays. In regard to hilar tuberculosis he said the term should refer to infections of the hilar glands and not to the lung substance. In the literature much confusion had arisen about this point. Research had shown that the removal of secretions from the bronchioles was in part caused by the contraction of the bronchiolar musculature. This was probably of greater importance than the action of the cilia.

DR. E. R. CORDNER, in discussing the differential diagnosis between tuberculous and non-tuberculous chronic pulmonary disease, wondered whether the presence of an antral infection might indicate a non-tuberculous condition.

DR. H. LAWRENCE STOKES stressed the importance of preventoria for the treatment of recent tuberculous contacts. He realized, however, that finance was the greatest stumbling block to their establishment in Victoria.

Dr. Guy Springthorpe, in reply, first referred to Dr. Dale's suggestion that it would be interesting to know the number of positive results to skin tests in Australia, and he supported this. He said that a recent publication by the Medical Research Council of H. H. Scott's investigations, which were based on three hundred pulmonary tuberculous infections, two hundred of which were in children, gave an admirable account of the present knowledge of the pathogenesis of tuberculous disease. Dr. Springthorpe recalled a paper published in France in which the writer did not think that the subcutaneous tuberculin test was quite specific. While he agreed that radical antral operations were not advisable as a rule in children, some developed a chronic polypoidal condition which resembled that frequently seen in infections in adults. He then referred to Dr. Norris's remarks with regard to D'Espine's sign, and said that he did not know how the authorities which he had quoted had investigated it, but they were agreed that it was not of much value.

Dr. Springthorpe concluded by referring to Dr. O'Sullivan's statement that careful X ray examination would demonstrate the presence of some enlarged hilar glands in spite of the fact that no calcium had been deposited in them. He quoted McPhedran, who had said that calcium deposition was necessary for the X ray demonstration of these gland shadows.

Public Health.

POLIOMYELITIS.

AT the meeting of the Federal Committee of the British Medical Association in Australia, held at Melbourne in March, 1931, Dr. A. W. Shugg was appointed a subcommittee to report to the chairman on the subject of the treatment of patients suffering from the effects of poliomyelitis. Appended hereto is Dr. Shugg's "Statement of Case."

The organization in a State for the efficient control of poliomyelitis should be a central authority controlling the administration dealing with:

(*a*) Early treatment. This branch includes the care of donors, collection of blood, manufacture and distribution of serum. Provision should also be made for facilities for early diagnosis and for a sufficient supply of hospital beds.

(*b*) Curative treatment of paralysed patients.

1. Accommodation: (*a*) An adequate number of beds are required for treatment of: (i) Country patients, (ii) adults, (iii) very extensively paralysed patients. The accommodation need not in many cases be in general hospitals, but preferably in convalescent hospitals, where the overhead expenses are much less. The recognition of the necessity of making these beds available to the cases for a time of up to three years is important. (*b*) Out-patient clinics, with provision for supervision of care of cases in their homes. (ii) The establishment of small groups of cases in homes managed by capable women, preferably ex-nurses.

2. Supervision of the patients by medical practitioners who have had special experience in this work.

3. Splints. Provision must be made for the manufacture, fitting and alteration of splints.

4. Reeducation of muscles. Specially trained masseurs are required in adequate numbers, both at the hospitals and for visiting outlying centres.

5. Education of the children.
6. Vocational training for the young adults, including the important psychological aspects of self-reliance and independence.
7. The stimulation and correlation of the activities of organizations interested in obtaining employment of the partially crippled. This is most important in retaining the good will of future donors of blood.

This general scheme should make the basis of the organization in each State, amplified and modified according to the local conditions.

The responsibility of financing the organization should be distributed thus:

1. The individual. Patients' contributions to be obtained to the maximum degree.
2. Voluntary contributions, for example, encouragement in formation of trust funds to provide for individuals or groups of cases in districts.
3. Municipal contributions, particularly in dealing with the acute infectious stages.
4. General hospitals, by the provision of a number of beds.
5. State contributions, to assist in preventing economic loss by disablement of its future workers.
6. Annual Federal grant to the States.

That such a scheme is practical and economic has long been recognized in Vermont, United States of America, where the disease has been endemic for many years. There organization is now widespread in the State, efficient, and gives sound economic results.

There are few diseases which, if neglected, give such economic wastage, yet, if efficiently treated, so amply repay for the efforts expended by permanent and complete cure in such a large percentage of cases. Even when the cure is not complete, the prevention of deformities and the degree of recovery in the affected muscles is such that only a very small percentage of cases cannot be made self-supporting members of the community.

At present there are 347 patients with poliomyelitis drawing invalid pensions, mostly from the small epidemics of 1898, 1908, 1918. This means an annual pension rate of £18,000 to be continued for many years, and which cannot now economically be lowered by any treatment to these cases.

But since 1925 about 800 cases have occurred in Victoria alone; since December, 1929, there have been 140 cases in Tasmania, and in the other States many cases have also occurred. A severe outbreak is now occurring in Victoria. Practically none of these patients is now eligible, on account of age, for invalid pensions, but in the years ahead increasing numbers of young adults with a long expectation of life are going to be eligible for pensions, and the majority of cases occur amongst those who will claim their pensions.

An analysis of a group of 66 cases in Tasmania shows the importance of effective treatment: Twenty-three now normal. Nineteen now practically normal. Some will have a permanent slight disability with no deformity. Nine will require apparatus to aid walking; no appreciable deformity. Three potential invalid pensioners. Four deaths. Eight not reporting, no case having any serious disability when last seen.

A most conservative estimate of the number saved from becoming pctential pensioners is 15. Giving these 15 patients an average expectation of life of forty-five years from the attainment of sixteen years of age, the total ultimate saving at the present pension rate to the Commonwealth is £34,100. These results were obtained without effective organization for treatment in the early months of the epidemic. Many similar but larger groups can be quoted from the Victorian cases, but no statistics are at present available.

From the foregoing it will be seen that the objections that the Commonwealth is not justified in entering this sphere of activity is economically unsound; and, furthermore, it cannot be contended that a precedent would be created that the Commonwealth should act likewise in other medical fields, owing to the characteristics of the disease in question and its economic sequelæ.

Conference on Poliomyelitis.

A conference on poliomyelitis was convened by the Commonwealth Department of Health at Canberra on April 21 and 22, 1931. It was attended by delegates from the poliomyelitis committees of Victoria, New South Wales, South Australia and Tasmania, and representatives from the State health departments and the British Medical Association. Other medical men and women who had given special attention to this disease, were also present.

Among the aspects of the subject which came under discussion were a statistical review, the present organization in the States, the epidemiology, symptoms and diagnosis of the disease, immune serum treatment, the manufacture of serum, the treatment of after-effects, the problem of cripples and the education of the medical profession.

The resolutions adopted by the conference were:

That poliomyelitis and polioencephalitis should be regarded for all administrative and statistical purposes as one disease.

The conference considers that an epidemiological inquiry into the course of poliomyelitis and the history of each recorded case should be carried out by the Commonwealth Department of Health on similar lines to the investigation into cases of endemic typhus fever.

The conference urges the Commonwealth Government, in view of the valuable results already obtained, to continue the subsidy to the Walter and Eliza Hall Institute, to be applied to continuation of the research into the virus of poliomyelitis and investigations directed towards practical improvements in the provision of serum.

The conference commends earnestly to the Commonwealth Government the fact, well recognized by the medical profession, that many invalid pensioners now receiving pensions for physical disabilities can, with appropriate treatment, be rendered either wholly or partly economically independent.

That in each State an endeavour be made to establish a committee or other suitable body to encourage and supervise the after-care of persons who have disabilities following poliomyelitis and who have other crippling conditions, and that the Commonwealth and State Governments be requested to assist financially in the inauguration and maintenance of such organizations.

That each education department be recommended to make education of cripples compulsory and to provide the necessary buildings, equipment and transport for this purpose.

That the education department in each State be asked to consider seriously the possibility of instituting vocational training for cripples.

That the Commonwealth Government be recommended to subsidize the States and to assist the campaign against poliomyelo-encephalitis, with special reference to: (*a*) Preparation and testing of serum; (*b*) testing efficiency of pooled adult serum; (c) early serum treatment in the acute stages of the disease; (*d*) appropriate treatment in the convalescent and late stages of recovery in order to assist towards the prevention of permanent disabilities, and to the restoration of economic independence.

This conference recommends to the faculties of medicine that, in view of the increased incidence of poliomyelo-encephalitis in the Commonwealth, the subject should receive increased attention in the medical curriculum.

That this conference recommends to the massage associations of the States that, in view of the value of masseurs skilled in muscle reeducation, the attention of the associations be directed to the recently increased attention to this part of the curriculum.

This conference considers that the presentation of the various clinical and therapeutic aspects of

poliomyelitis by means of the cinematograph is so valuable that steps should be taken to prepare, duplicate and circulate a suitable film for this purpose.

Post-Graduate Work.

COURSE OF LECTURES IN BRISBANE.

A COURSE of post-graduate lectures will be held at Brisbane from June 1 to 5, 1931. The Bancroft Memorial Lecture will be delivered by Professor F. Wood Jones on Friday, June 5, 1931. The other lecturers will be Dr. B. T. Edye and Dr. Herbert Schlink. The syllabus is appended.

Monday, June 1, 1931.

9 a.m. to 12 noon, at the Brisbane Hospital.—Dr. B. T. Edye: Operations.

3 p.m. to 5 p.m., at the B.M.A. Rooms.—Dr. B. T. Edye: Lecture, "Acute Abdominal Surgery."

8.15 p.m., at Lennon's Hotel.—Dance and Bridge Party.

Tuesday, June 2, 1931.

9 a.m. to 12 noon, at the Mater Misericordiæ Hospital.—Dr. H. H. Schlink: Operations.

3 p.m. to 5 p.m., at the B.M.A. Rooms.—Dr. B. T. Edye: Lecture.

8.15 p.m., at the Geology Theatre, University.—Dr. H. H. Schlink: Lecture, "Injuries due to Child-Birth."

Wednesday, June 3, 1931.

9 a.m. to 12 noon, at the Mater Misericordiæ Hospital.—Dr. B. T. Edye: Operations.

3 p.m. to 5 p.m., at the B.M.A. Rooms.—Dr. H. H. Schlink: Demonstration, "Gynæcological Pathology."

8.15 p.m., at the Geology Theatre, University.—Professor C. G. Lambie: Lecture, "Differential Diagnosis between Supra- and Infra-Diaphragmatic Conditions."

Thursday, June 4, 1931.

9 a.m. to 12 noon, at the Brisbane Hospital.—Dr. H. H. Schlink: Operations.

3 p.m. to 5 p.m., at the B.M.A. Rooms.—Professor C. G. Lambie: Demonstration, "Disturbances of Ductless Glands."

7.15 p.m., at Rowe's Banquet Hall.—Annual Dinner, Queensland Branch of the British Medical Association.

Friday, June 5, 1931.

9 a.m. to 12 noon, at the Brisbane Hospital.—Dr. B. T. Edye: Operations.

3 p.m. to 5 p.m., at the Mater Misericordiæ Hospital.—Professor C. G. Lambie: Demonstration, "Neurological Cases."

8.15 p.m., at the Geology Theatre, University.—Professor F. Wood Jones: Bancroft Memorial Lecture, "The Changing Point of View."

Correspondence.

THE PATHOLOGY OF RETINITIS PIGMENTOSA.

SIR: In view of the recent interest in the pathology and treatment of *retinitis pigmentosa* I would like to draw your attention to an article by Verhoeff, of Boston, which appeared in the March number of the *Archives of Ophthalmology*. Verhoeff had the good fortune to examine an eye thus affected excised from a living person. It would be well if an abstract of this article could be published in THE MEDICAL JOURNAL OF AUSTRALIA.[1] In very brief he concludes that the essential ocular lesion is progressive degeneration of the retinal neuro-epithelium, the rods being the first affected. The reduction in calibre of the retinal vessels is due to increased thickness of the adventitia. The optic nerve shows little, if any, atrophy. The retinal changes cannot be due to vascular changes, because still greater obstruction of the retinal circulation does not lead to degeneration of the neuero-epithelium. The vascular changes are the result of the degeneration of the neuro-epithelium. Collins's theory of abiotrophy explains the facts well, but should not be accepted until other possibilities have been excluded. The theory that the disease is due to disturbance of the hepatic function is worthy of serious consideration, but requires additional evidence to support it. If, in spite of this dismal pathology, sympathectomy does in fact cure or improve the condition, no one will more cordially congratulate the author than the present writer.

Yours, etc.,

J. C. HALLIDAY.

185, Macquarie Street,
Sydney,
May 11, 1931.

Obituary.

FREDERICK JOSEPH RICHARD CADE.

WE regret to announce the death of Dr. Frederick Joseph Richard Cade, which occurred at Narrabri, New South Wales, on May 16, 1931.

AUSTRALIAN MEDICAL LITERATURE.

AN important addition has been made to the Commonwealth Parliamentary Library for inclusion in the National Library. Dr. J. H. L. Cumpston, Director-General of Health, has presented to the library a collection of Australian medical literature. The gift represents upwards of twenty years' work and comprises almost everything dealing with medical matters that has been printed in Australia in journals, pamphlets, books, official reports and parliamentary papers. Dr. Cumpston's generous act will be appreciated by all who are engaged in research. Application should be made to the Commonwealth Parliamentary Librarian by those desirous of consulting the volumes.

Books Received.

THE PRACTICAL MEDICINE SERIES: PEDIATRICS; Series 1930. Chicago: The Year Book Publishers. Crown 8vo., pp. 451. Price: $2.25 net.

THE PRACTICAL MEDICINE SERIES: GENERAL SURGERY; Series 1930. Chicago: The Year Book Publishers. Crown 8vo., pp. 848. Price: $3.00 net.

FIJI AND THE FIJIANS, 1835-1856, by G. C. Henderson, M.A.; 1931. Australia: Angus and Robertson Limited. Royal 8vo., pp. 344.

ROENTGEN INTERPRETATION, A MANUAL FOR STUDENTS AND PRACTITIONERS, by G. W. Holmes, M.D., and H. E. Ruggles, M.D.; Fourth Edition; 1931. Philadelphia: Lea and Febiger; Australia: Angus and Robertson. Royal 8vo., pp. 351, illustrated with 237 engravings.

[1] An abstract of the article in question will be found on page 668.

RECENT ADVANCES IN CARDIOLOGY, by C. F. Terence East, M.A., M.D., F.R.C.P., and C. W. Curtis Bain, M.C., M.B., M.R.C.P.; Second Edition; 1931. London: J. and A. Churchill; Australia: Angus and Robertson. Demy 8vo., pp. 363 with 10 plates and 62 text-figures.

HAPPY MOTHERHOOD, by P. W. Yeomans; 1931. London: William Heinemann (Medical Books) Limited. Crown 8vo., pp. 167. Price: 3s. 6d. net.

Diary for the Month.

JUNE 2.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 3.—Victorian Branch, B.M.A.: Branch.
JUNE 4.—South Australian Branch, B.M.A.: Council.
JUNE 5.—Queensland Branch, B.M.A.: Branch.
JUNE 9.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 11.—Victorian Branch, B.M.A.: Council.
JUNE 12.—Queensland Branch, B.M.A.: Council.
JUNE 16.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 24.—Victorian Branch, B.M.A.: Council.
JUNE 24.—South Australian Branch, B.M.A.: Annual Meeting.
JUNE 25.—New South Wales Branch, B.M.A.: Branch.
JUNE 26.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. C. P. Stewart (B.M.A.) has been appointed Principal Medical Officer, Medical Branch, Department of Public Instruction, New South Wales.

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Dr. F. S. Hone (B.M.A.), Dr. W. Ray (B.M.A.), Dr. E. A. Johnson (B.M.A.), Dr. H. S. Newland (B.M.A.) and Dr. C. T. Ch. de Crespigny (B.M.A.) have been appointed to the Advisory Committee under the provisions of the *Hospitals Act Amendment Act*, 1921, South Australia.

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Dr. B. S. Hanson has been reappointed Medical Officer in the Radium and Deep X Ray Therapy Departments of the Adelaide Hospital, South Australia.

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Dr. H. P. Martell has been appointed Government Medical Officer at Adelong, New South Wales.

* * *

Dr. G. A. Lawrance (B.M.A.) has been appointed Medical Officer, Department of Mental Hospitals, New South Wales.

* * *

Dr. G. E. Aitken (B.M.A.) has been appointed a Member of the Mental Deficiency Board, Tasmania, for a period of three years as from April 1, 1931.

* * *

Dr. F. W. Cotton (B.M.A.) has been appointed as Quarantine Officer, Cossack, Western Australia.

* * *

Dr. J. Kenny (B.M.A.) has been appointed as Quarantine Officer, Esperance, Western Australia.

* * *

Dr. J. B. Dawson (B.M.A.) has been appointed Professor of Obstetrics and Gynæcology at the University of Otago, New Zealand.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes*, sought, etc., see "Advertiser," page xiv.

CALLIDE VALLEY DISTRICT HOSPITAL, BILOELA, QUEENSLAND: Visiting Medical Officer.
DEPARTMENT OF INSPECTOR-GENERAL OF HOSPITALS, ADELAIDE, SOUTH AUSTRALIA: Honorary Vacancies.
MATER MISERICORDIÆ PUBLIC HOSPITAL, SOUTH BRISBANE, QUEENSLAND: Resident Medical Officer.
THE BRISBANE AND SOUTH COAST HOSPITALS BOARD, QUEENSLAND: Honorary Vacancies.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members desiring to accept appointment in ANY COUNTRY HOSPITAL, are advised to submit a copy of their agreement to the Council before signing, in their own interests. Brisbane Associated Friendly Societies' Medical Institute. Mount Isa Hospital. Mount Isa Mines. Toowoomba Associated Friendly Societies' Medical Institute.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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